FEBRUARY.

THE

FIELD NATURALIST:

A REVIEW

OF

ANIMALS, PLANTS, MINERALS, THE STRUCTURE OF THE EARTH, AND APPEARANCES OF THE SKY.

EDITED

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CONTENTS.

PAGE.

The Zebra Spider (*Epeira fasciata*, Fabricius). With a coloured figure of the female and her nest of eggs, drawn from the Editor's Specimen. By the Editor 57

Retrospective Remarks. By James Fennell 61

N. N.'s Agenda. The Llama of Peru. 66

On the Advantages of the Study of Natural History 67

On the Migration of Birds. By T. C. 70

On the Root of an Ash Tree. By R. T. C. 72

Notes from the Isle of Wight. By S. W. 73

Notes on Birds. By T. C. 75

On Tame Nightingales. By Ornithologus 77

Geological Positions, in direct proof of an important part of Scripture Chronology. 79

Vultures. From Le Vaillant's Birds 83

M. Biot on the Sap of Plants 89

The Effects of Music, Electricity, Magnetism, and Galvanism, upon Animals. By James Fennell 91

On the Singing of the Swan. By Sir T. Browne, M. D., Norwich . . 98

On Instinct in Birds. By C. W. S. 100

Chapter of Varieties—

Effects of Inundations on the Haunts of Small Birds—Black Rat—Sparrows building in Winter—January Remarks—Rat's Nest—Razor Bill—Hostility evinced by the Lapwing to Crows—Transparency of the Sea—Hawk Shooting—Establishment of a Rookery—Sandpiper and Stint—Rookeries—Sagacity in a Horse—Singular Habit in a Bachelor's Cat—Effects of Mountain Heights on Plants—Migratory Birds in Cornwall—Floating Islands—On the Animalculæ found in Water—Fanning of the Wings of certain Insects—Animals swallowing hard Substances 101

CORRESPONDENCE.—The Editor does not know what insect is designated *Tipula Ichneumonia*, and does not know where it is to be procured. A Constant Reader, Edinburgh, must have inquired at Anti-charter Booksellers, when he could not get "HABITS OF BIRDS," a recent volume of the Library of Entertaining Knowledge. A Constant Reader, Stoke Ferry, is informed that the edition of 1651, may be worth from 5*s.* to 7*s.*

G.E. Medley del. & Willoughby & Brown.

THE ZEBRA SPIDER (Epeira fasciata.) AND NEST.

THE

FIELD NATURALIST.

THE ZEBRA SPIDER (*Epeira fasciata*, FABRICIUS).

[*With a coloured figure of the female and her nest of eggs, drawn from the Editor's specimen.*]

BY THE EDITOR.

WHEN I resided in Normandy, in 1829, the rugged cliffs at Cape La Hêve formed my favourite spot for field excursions, and I seldom went thither, without meeting with something new or interesting, though I had repeatedly traversed every foot of the ground that was accessible. Geological fossils of the oolitic series, plants, shells, insects, reptiles, and birds alternately attracted my attention, and furnished me with numerous facts, which I might in vain have searched for in books of Natural History. This very shore, indeed, had previously been perambulated by two distinguished native naturalists; but St. Pierre seldom condescended, in the midst of his excursive fancies, to look at the more minute facts; and Deterville, though a sufficiently minute observer, had no idea of generalising; while it is more congenial to my turn of mind to combine these extremes, observing minutely to obtain facts, and bringing these facts to bear on some general inference, or some philosophic induction.

In one of my excursions to Cape La Hêve, towards the end of summer, I had clambered high up on the grassy escarpment, in pursuit of a butterfly, and, in order to reach the path along the shore at the base of the cliff, I was compelled to make my way through a thicket of brambles and blackthorn, mid-way down the slope. A field naturalist, in such cases, is rarely out of his way. In an opening among the brambles, I remarked a spider's web, of unusual dimensions and texture, with geometrical meshes, but these far too wide to have been

made by the garden spider (*Epeira diadema*), or any similar species; while the centre of the web was much more opake and broader than I had ever remarked in others. The whole web was also but slightly sloped from a horizontal position, another striking peculiarity; for the garden spider and its congeners place their webs nearly vertical. The rustling, which I had made amongst the bushes, had frightened the spider to its retreat; but I soon discovered it, and was not a little surprised at its great size and the brightness of its colours, so different from any species previously known to me.

Pleased with my discovery, I took the creature home, and let her go in my study, where she soon constructed a web in the corner of the window; but was compelled to make it more vertical than the one she had previously made among the brambles.

By careful search near the place, I discovered eight other Zebra spiders, all females, and six nests of eggs, which I took with me, as well as some of the living spiders to England, expecting to be able to rear a few of them as a matter of curiosity, but I was unsuccessful; for not one of the eggs was hatched, probably from the air of my study being too close, when compared with the sea breezes at La Hêve, where they had been destined by their mothers to winter.

I never observed this spider depositing her eggs, but I have many times seen other species do so, and infer that they proceed in a similar manner. Looking at the size of the spider, and at that of the egg which she lays, it appears almost incomprehensible how they could be contained in so small a body; but, by observing them more closely, it may be discovered that they have not, like the eggs of birds, a hard shell, being on the contrary soft and compressible. Accordingly, before they are laid they lie in the egg bag (*ovarium*) within the spider's body, squeezed together in a flat manner, and only come into a globular form after they are laid, in consequence of the equal pressure of the air on every side, in the same way as we see dew drops, and globules of quicksilver formed from the same cause.

The eggs of spiders, it is worthy of remark, are in most cases, though not always, placed in a roundish ball; and as there is nothing in nature without some good reason, if we can discover it, we may infer that this form is designed to economise the materials of the silken web which the mother spins round them by way of protection. Whether I am right or not in this conjecture, there can be no question as to the manner in which the ball is shaped, as I have often observed the process. The mother spider, in such cases, uses her own body as

a gauge to measure her work, in the same way as a bird uses its body to gauge the size and form of its nest. The spider first spreads a thin coating of silk as a foundation, taking care to have this circular by turning round its body during the process. It then in the same manner spins a raised border round this, till it take the form of a cup; and at this stage of the work it begins to lay its eggs in the cup, not only filling it with these up to the brim, but piling them up above it into a rounded heap, as high as the cup is deep. Here, then, is a cup full of eggs, the under half covered and protected by the silken sides of the cup, but the upper still bare, and exposed to the air and the cold. It is now the spider's task to cover these, and the process is similar to the preceding; that is, she weaves a thick web of silk all round them, and instead of a cup-shaped nest, like some birds, the whole eggs are enclosed in a ball, much larger than the body of the spider that covered it.

Dr. Heineker found the zebra spider common in Madeira, and M. Leon Dufour, in Spain. The following is

Walckenaer's Description.—Corselet and upper base of the abdomen silvery; back yellow, with black wavy crossing bands, somewhat contiguous; belly black, with two yellow bands placed lengthwise.

Synonymes.—Araneus septimus totus viridis et pratensis, protenso corpore, et acuto alvo lineis candidissimis quinque insignita. Aldrovandi de Anim. Insect., Francofurti, 1618, p. 240, D, fig. 11, No. 7. Id. De Insectis, Bononiæ, 1602, p. 607 et 609, fig. 7.—Ar. Septimus. Jonstonius de Insectis, Francofurti, 1653, p. 134, tab. 18, fig. 7.—Ar. Tarentina. Bonanni Micrographia, 4to, Romæ, 1691, p. 70, fig. 69, 70 et 71.—Ar. Zebra. Sulzero abgekurtze Geschichte der Spinner, 4to, 1776, p. 254, fig. 15.—Ar. Speciosa? Cosaccis ad Jaikum Bojie Misgnir, i. e., Aranea sacrariorum. Pallas Voyages, traduit par la Peyronie, Paris, 1789. In 4to. vol. 2, p. 543, No. 40.—Der Heilige Spinne? Ibid. Reisen 2. Ausg. Auh., p. 36, No. 97, et Muller's Suppl. und Reg. B. p. 343, t. 51.—Ar. Speciosa. Goeze, System Naturg. der Spinnen, p. 267, No. 41.—Ar. Pulchra. Razoumowsky, Lettre à M. Reynier sur une Araignée dans le Journal de Physique et d'Histoire Naturelle de Rozier, 1787, t. 2, p. 372.—Ar. Pulchra. Razoumowsky, Hist. Nat. du Jorat, p. 244, No. 333, pl. 3, fig. 14.—Ar. Fasciata. Ar. Fasciée, Olivier, Encyclop. Method. Ins. t. 4, p. 188, No. 1, et p. 198, No. 1. Ibid. pl. 18, partie, pl. 261, fig. 14.—Ar. Formosa (la belle). C. de Villiers c. Linnæ Entomolog., Lugduni, 1789, p. 130, No. 125, pl. 11, fig. 10.—Ar. Fasciata. Fabricius, Entomol. Systematica, p. 414, No. 28.—Ar. Phragmitis. Rossi, Faun. Etrusca, t. 2, p. 128, No. 964, tab. 3, fig. 13, et tab. 9, fig. 15.—Ar. Speciosa. J. F. Hermann, Aranea Rheni medii, p. 4, tab. 4, et 5.—Ar. Fasciata. Gmelin, Linnée Systema Nat. edit. 13, t. 1, partie 5, p. 29 46, No. 48.—Ar. Fasciée. Latreille, Hist. Nat. des Crust. et des Insect. t. 7, p. 269, No. 79.—Epeire Fasciée. Walcken. Tableau des Araneides, p. 55, No. 4.—Epeira Fasciata, Latreille, Genera Crustac. et Insect, t. 1. p. 106, spec. 8.

"Eyes lateral, touching each other, the front one red, the hind one black and larger. Corselet flattened with silvery hairs. Breast yellow

in the middle, black at the sides. Mandibles yellow and sometimes brown on their upper part. Abdomen in a lengthened yellow oval, crossed by black transverse bands, which form so many segments; the first, the third, the fifth, and sixth segments often covered with silvery hair; the fourth black transversal line always more markedly waved than the others. Belly black in the middle, with some yellow points, and two yellow longitudinal lines on the sides. Feet long and robust, ringed with black and with a reddish yellow, thighs of the front pair of legs tinged with black. Feelers (*palpi*) yellow with black prongs (*piquants*).

" Pallas, de Villers, and Rossi have published excellent descriptions of this beautiful species, and much more extended than that which we have just given; but for this reason have been more embarrassing on account of the varieties. Rossi has published the most accurate figure of the species.

" I am somewhat inclined to refer to this species, the spider of LEPECHIN, *Tagebuch*, t. ii. p. 316, tab. xvi. fig. 1, since he took it in the same country as Pallas; but the transverse bands are not waved in Lepechin's figure, and appear differently disposed. His figure much resembles that of the *Aranea Luzon*, of Petiver, Gazophyll, tab. l. no. 3, and indeed these two figures resemble also the *Aranea fasciata* which Poiret has brought from Barbary, and which he has described and figured in M. Rosier's Journal de Physique, t. ii. p. 114, pl. i. fig. 3. The description which he gives of its cocoon, differs in every thing from ours, and is conformable to the cocoon of the *Aranea luzon* of Petiver.

" I am led to believe that the species described by these authors ought to be referred to the *Aranea trifasciata* of Yorskal, and which he took at Cairo. I have seen this *Epeira* in the collection of M. de Savigny who brought it from Egypt, and who ought to give a detailed description of them. It differs specifically from ours by the transverse bands being less waved, and by an abdomen less elongated. The letter of Razoumowsky upon the spider of Poiret contains many errors both of the author and printer; but he has well described the eyes, particularly the lateral ones.

" This spider is common in all the south of Europe; it was recently found in the environs of Paris, where it is rare. MM. Hermann have often taken it near Strasburg. Pallas has described it on the borders of the river Jaik or Ural, to the north of the Caspian Sea.

" This spider likes moist places, on the borders of streams as well as

the streams themselves, when their borders are covered. Hermann, in his manuscript work, says, 'he has seen them more than once suck at the drops of water which were on the leaves.' Its cocoon is an abrupt oval, greyish marked, longitudinally with black bands, and shut hermetically at the abrupt end.

"Pallas tells us, that the Cossac of the borders of the Ural have a sort of veneration for the *Aranea speciosa*, because it penetrates often into the houses, and because it suspends its net to the statues of the domestic divinities which are there. It is not certain that this spider of Pallas ought to be referred to our species, and it is perhaps the same as the *Aranea trifasciata* of Yorskal. The descriptions of these two species resemble each other in every thing.

"M. Ray, in his Zoologie Portative, page 54, gives to the article upon *Araignée portefeuille* of Geoffroy, the extract of a memoir of M. Dorthe's, who appeared not to have had this species in view, as Ray believed, but our *Epeira fasciata*, the cocoon of which he had described very well. The Journal of Nat. Hist., of Bertholon, where the observations of Dorthe are said to occur, not being found in the imperial library, where we had sought for it in vain, we could not present the results."—*Hist. Nat. des Aranéides*, No. iii. fig. 1.

All seem to agree that this species prefers damp marshy places; but the eight specimens, which I obtained at La Hêve, were all found in a remarkably dry locality, about one or two hundred feet above tide mark.

Lee, Kent.

RETROSPECTIVE REMARKS.

BY JAMES FENNELL.

I THINK it not improbable that your correspondent, Mr. Ball, of Dublin, will, upon careful examination, find the cuckoo mentioned by him at page 7, of the volume just concluded, to be an American species, either the *Coccyzus Carolinensis*, Bonaparte, or else the *Coccyzus erythrophtalmus*, which by some persons has been confounded with the former, from which it may be easily distinguished by its having, according to Wilson, "a bare wrinkled skin of a deep red colour," surrounding the eye, and also by its being much smaller, and its wings being destitute of the cinnamon colour observable upon that species. From the circumstance of the description given in your pages

having been taken from a coloured drawing and not from the bird itself, it is so imperfect in its details as to be very little assistant to the ascertaining of its species; yet some of the more permanent characters mentioned therein accord pretty well with those of the Carolina cuckoo, (*Coccyzus Carolinensis,*) two specimens of which are stated in the Philosophical Magazine (vol. iii. page 62,) to have been lately met with in Ireland, and a single individual to have been exhibited at a meeting of the Zoological Society on February the 26th, 1833, shot in Wales during the preceding autumn, on the preserves of Lord Cawdor, by whom it was transmitted to London for scientific examination.

Your correspondent "Solitarius" (in whom I think I can recognise a very intimate acquaintance of mine,) states in his "Miscellanies," published in your November number, that he had a specimen of (*Blaps obtusa*) that lived for three weeks without food. A similar, but more remarkable instance of abstinence from food with respect to another species, (*Blaps mortisaga,*) is mentioned by Mr. Baker, the celebrated microscopic observer, who says that he kept one without a morsel of nourishment for the space of three years. The statement which "Solitarius" has introduced into the above named contribution, respecting the reanimation of bees after they had been "well-boiled," may appear to some persons quite incredible, but is not altogether so improbable, for Mr. Spence whose zeal in entomology is a sufficient guarantee for his veracity, tells us at page 237, vol. ii. of his valuable "Introduction," that he once took from the hot dung of his cucumber-bed a small beetle, (*Lyctus Juglandis, F,*) which he immersed in boiling water until he conceived it to be dead; but upon taking it out and laying it to dry it soon showed symptoms of life and regained sufficient strength to walk. Upon this curious and surprising exhibition of resistance to a degree of heat that would have proved fatal to other animals, Mr. Spence remarks, that the native station of that species "being of so high a temperature, Providence has fitted it for it, by giving it extraordinary powers of sustaining heat."

Mr. Clarke's instance (p. 511) of cats catching fish is not the only one on record, several having been furnished by various writers. The author of the "Menageries" at page 208, vol. i., gives an instance which he witnessed of a cat's seizing an eel out of a pail of water, and quotes an account of a similar nature, from Dr. Darwin, respecting a cat being in the constant habit of catching trouts by darting upon them in the water. Many other accounts, all proving that this is a common and a natural habit of the domestic cat as well as of the jaguar (*Felis*

onca), (which is a famous swimmer,) and said to attract its finny prey by dropping its spittle upon the water, have been published in the Magazine of Natural History.

That the winged pupæ of *Ephemeræ* cast their skins, and with them their beautiful wings, as stated at page 512, is a well known fact mentioned in introductory works on entomology. I once had the pleasure of witnessing the pupa discarding its infantile dress for one better adapted for that state of life into which it was about to enter; an exhibition putting one in mind of a fair and innocent virgin laying aside her maiden-dress to assume the gay apparel of a bride.

"RURICOLA," having, at p. 449, spoken of his having obtained an enormous mushroom, I am induced to draw the attention of your readers to another record of a very large mushroom which, although not equal to his in point of size, yet exceeds the usual dimensions. In the Morning Herald, of October 16, 1833, it is stated that the family of a Mr. Coulton, of the Pig and Whistle, Macclesfield, "supped off a mushroom, which was brought from Shirley Fold, and was in circumference at the top two feet and six inches, eight inches round the stalk, and weighed two pounds and a half."

To some of the numerous queries of "N. N." (p. 535) who appears by his preliminary observations to put but little value upon Natural History, unless it be made conducive to the fattening of barn-door fowls, I will endeavour to reply; but I am somewhat suspicious that his questions are put more with the desire of ridiculing our pursuits, than to be informed upon the subjects mentioned in his communication. He seems to think with Cobbett, that the study of Natural History is next to useless, unless its principal object be the increase of our already very ample stock of luxuries in the way of food. Though he does not perceive that much information is derivable from studying the architecture of "a cock-robin's" nest, yet experience proves that a great deal of useful knowledge may be reaped by those who pursue the investigation of that or any other object, (however insignificant it may appear to an ordinary and unthinking mind,) with a proper and philosophic spirit. He is certainly much mistaken in asserting that the Horticultural and the Zoological Societies have effected but very little good. Let him procure a prospectus of each of these Societies, or consult any well-informed botanist and a zoologist, and then, perhaps, he will be induced to alter the opinion he has so rashly stated. The Zoological Society have, I think, done as much as they well could do, in endeavouring to introduce foreign animals, possessing superior

qualities, and requiring less trouble and expense, into the parks, &c. of John Bull, who is not easily to be induced to divest himself of his vulgar and erroneous prejudices against rearing and eating what he terms "curosities." In the very elegant work entitled "The Gardens of the Zoological Society delineated," published under the superintendence of the secretary and vice-secretary, are many hints upon the management of poultry. Speaking of the golden pheasant (*Phasianus pictus*), they remark, that it requires no small degree of care and attention to procure a breed from this species, and inform us "that much of the difficulty, as well as of the tenderness of constitution manifested by these birds, is attributed by M. Temminck to the close confinement in which they are usually kept, and to the very precautions which are taken to preserve them from the effects of cold." He advises that they should be gradually habituated, like the more common race, to the large pheasantries in which the latter are preserved, and doubts not, that, as they multiplied under such circumstances, they would become more and more hardy, until at last they would be fully capable of supporting the cold of our northern winters. The experiment, he tells us, has already been made in Germany, where they have been kept at perfect liberty in an open pheasantry, in company with the common species, and suffered no greater inconvenience than the latter from the change of seasons. We anticipate an equally favourable result from the repetition, under the auspices of the Zoological Society, of this attempt to naturalise so brilliant an addition to our native game. Such an experiment could not have been made with any success in the gardens in the Regent's Park; but the farm in the neighbourhood of Kingston, of which the Society has lately become possessed, affords the fairest prospect of carrying this and many similar undertakings into complete effect*." The silver pheasant (*Phasianus nycthemerus*) they say, thrives "better in domestication than the common pheasant of our woods, and breeds with tolerable facility; so that it might, in all probability, be readily propagated in the open country. We believe that this has, in some instances, been attempted with success†." Respecting the introduction of curassows, the editors of the work from which these extracts are taken, tell us that they have no doubt that the crested curassow (*Crax alector*) with proper treatment would speedily become habituated to the climate of our country, and that "numerous examples have shown that they thrive well even in its

* Zool. Soc. Gardens, vol. ii. p. 62. † Idem, p. 64.

northern parts;" and they expect that the Zoological Society will be as successful in naturalising the curassows as completely as our ancestors have done the equally exotic, and, in their wild state, much less familiar breeds of the turkey, the Guinea-fowl, and the peacock*. Now, as to the "*modus operandi*" in establishing a rookery. The only information I can procure upon this head is in the Magazine of Natural History, vol. 6, p. 334, where, in a note, the Rev. Mr. Bree of Warwickshire states, that he has learnt that "the readiest way to establish a rookery where one did not previously exist, is, to withdraw the eggs from the nest of a magpie that is about to sit, and has built near the place where it is wished the new colony should be raised, and to substitute in their room the eggs of the rook. The young birds, it is said, will return the following spring, and take up their quarters in the same tree in which they were reared."

The bird objectionably called the Virginian *nightingale*, it being in fact a species of grosbeak, the *Loxia cardinalis* of Wilson, I should hardly think it possible to naturalise in this country, the warblers of which are indeed so rich in point of melody, that, for my part, I fain would remain a stranger to the harmony of all foreign songsters, lest I should become less delighted with those of my native land. There are many, no doubt, who would like to see our groves inhabited by a host of screeching parrots; our gardens graced by the presence of the splendid bird of paradise, and each expanded flower fanned by the humming-bird's resplendent wings; but feeling well satisfied with the songs of such of the feathered race as inhabit this country, I am happy to be able to declare with Shenstone, that

> "I covet not the price of foreign looms;
> In search of foreign modes I scorn to rove;
> Nor for the worthless bird of brighter plumes
> Would change the meanest songster of my grove."

The lepidopterous insects mentioned by Mr. Blyth, at page 550, as having "night-shining eyes," are not the only species that exhibit a similar appearance. The eyes of several, when viewed in the dark, are found to be luminous: this is, as is well known, the case with *Acronycta Psi* and *Cossus ligniperda*, and to these I can add, from frequent observation, the names of *Plusia Gamma* and *Plusia Chrysitis*, the eyes of both of which species, when viewed in the dark, shine with considerable brilliancy.

* Zool. Soc. Gardens, vol. ii. p. 9.

P.S. The London Natural History Society, of which you published a notice at p. 417 of the volume just brought to a close, is doing pretty well; and we are of opinion, that in the course of a short time, when our number becomes augmented, we shall do very well*.

Paddington.

N. N's AGENDA.

THE LLAMA OF PERU.

We are indebted to the attention of a correspondent in Oban for the following account of the interesting attempt now making in that neighbourhood to domesticate the llama.

I am not surprised that the llamas here should be exciting attention, for they certainly are objects worthy of notice. This animal does not in any shape resemble the sheep of this country; its height is from four to five feet, with long legs and long neck, in some respects not unlike the camel, a small head without horns, the countenance gentle and expressive of wonder. It is not remarkable for any peculiar habits, except that it delights in ascending to the summits of the hills: its appearance indicates an unfitness for climbing; I observe, however, nature has served it with a hooked claw on each hoof, which enables it in some measure to travel heights with as much security as the goat. Their food and treatment differ in no particular from Mr. Stevenson's cows; they graze, eat hay, chopped straw and potatoes, with them daily, and have formed such an attachment to the cows, that when the latter are brought from the hill for the purpose of milking, the llamas will not remain behind, but accompany them to and from the byre three times a day, a distance of half a mile—the wool is extremely fine, each fleece weighing from five to six pounds. Mr. Stevenson imported the first pair (of the Alpacha breed, for there are several varieties) about three years ago—he tells me that there were four or five pairs shipped for him, but all died during the voyage except the one, and the following year he received another pair of what he terms the real llama, but a common observer cannot discern any difference. They inhabit the

* I wish all success to this, as yet young, Society, and hope to see contributions from others of its members, besides our present well-informed and enthusiastic correspondent.—Ed.

mountains of the Andes, and, when domesticated, are used in that country as beasts of burden, chiefly in carrying ore from the mines of Peru, and they carry about 100lbs., and if one pound be added more than they can carry with freedom, like the camel, nothing will impel them forward. If there was any chance of rearing them they would doubtless beome a benefit to the country, but I fear the hope of their breeding is very uncertain. Those who have any curiosity to see their wool, can inspect it by calling on Mr. Paterson, 138, Trongate, Glasgow; this gentleman received a quantity from Mr. Stevenson to get dressed.

ON THE ADVANTAGES OF THE STUDY OF NATURAL HISTORY.

In following up my last paper, I shall adopt the plan proposed in the commencement, and consider, first, the direct, secondly, the indirect, benefits which we may derive from the attainment of what I then showed to be the objects proposed by the study of Natural Science. First, then, we shall proceed to the consideration of the direct benefits: these, or at least some of the principal of these, (for here the difficulty consists, not in searching for what we may call benefits, but in making a selection from the vast number which immediately present themselves to us;) are as follows:—First, were there no other inducement than the mere observation of nature, in all her wildest forms and most beautiful appearances; to see, as is so graphically brought before us by the pen of Washington Irving, "the solemn pomp of groves and woodland glades, with the deer trooping in silent herds across them, the hare bounding away to the covert, or the pheasant suddenly bursting upon the wing; the brook winding in its beautiful meanderings, or expanding into a glassy lake, the sequestered pool, reflecting the quivering trees, with the yellow leaves sleeping on its bosom," this alone, without any farther benefits, would be sufficient to induce many to become enthusiastic votaries of the delightful study of Natural History. What naturalist, worthy of the name, is there, who cannot exclaim with the Mantuan bard,

> "Rura mihi, et regni placeant in vallibus amnes,
> Flumina amem, sylvasque inglorias——"

especially when we know that whilst we are thus luxuriating in Nature's loveliest haunts, we are occupied in discovering those "causas" of which the poet so much desired the knowledge? But this can

hardly be called a benefit; perhaps the following may be more deserving of the name. Secondly, the domestication, and consequent introduction to the purposes of civilised life, of the various tribes of wild animals, and the beauteous forms of the feathered creation. I was never more struck with this, than in the perusal of the delightful work lately published by the Zoological Society. The various animals, birds, &c., which are there shown to be capable of domestication, and of producing the most striking benefits to mankind in general, convince us, more than ever, of the benefits to be gained from the pursuit of Natural History. To this study, in some measure at least, are we indebted for the horse, that animal, the want of which we should so much feel; for all the feathered inmates of our farm-yards, and many others, the enumeration of which would encroach too much on your time and patience. The third direct benefit I would mention, refers to another branch of Natural Science, scarcely less interesting, viz. Botany; and the advantage to be acquired from this pursuit, which I should wish to bring forward is, the benefits derived from the discovery of plants and herbs, which may be useful in Medical Science. Here, perhaps, we may see most clearly the use of some system of Natural History. The botanist knows that a plant of a certain genus is useful as a medical herb; arguing from analogy, which is alone allowable in a case of this kind, on the discovery of a new plant which may be referred to the same genus, he imagines that this plant may be used in a case of a similar kind; a trial is made of it, and frequently the result answers to the expectations of the experimentalist. An admirable illustration of the truth of this position occurs in the history of the chemical substance entitled iodine. Long before the discovery of this substance which is procured from a kind of sea-weed, it was known that burnt sponge was an excellent remedy in cases of that dreadful malady, the Swiss goitre. On the discovery of iodine, (which was then perceived to exist in sponge, and most other marine productions,) Dr. Coindet, a medical practitioner of Geneva, imagined that this might also be used with efficacy in similar cases. He tried the experiment, and it is now well known, that iodine is a safe and sure remedy for goitre. I might mention other instances, but this most likely will be sufficient to establish my argument.

We may now, perhaps, proceed to consider what may be called the indirect benefits to be derived from the study of Natural Science.

If we see that some of the most singular productions with which we are acquainted, are the work of those animals whose habits and modes

of life I am now arguing the propriety of studying, I do contend that it is not only our interest, but our duty, to pursue that study which will make us better acquainted with their properties and peculiarities. Nor is this all; there is no study, which is more capable than the present, of lifting our thoughts to the understanding and comprehension of a Divine and Omnipotent Being. Whether we roam delighted through the fair scenes of nature, and wonder at the dazzling plumage of the feathered creation, admiring the myriads of animated beings, revelling in their native glades, and are led insensibly "From Nature up to Nature's God;" or whether we regard the formation of even a blade of grass, or the varied colours of the "meanest flow'ret of the vale," we can in every part trace the wisdom, power, and skill of Him

"Unde nil majus generatur ipso
Nec viget quidquam simile aut secundum."

Nor whilst we are pursuing the study of animated nature, must we neglect the sister, vegetable creation; we must remember, that the same hand which has formed the one, has formed the other, for, according to the magnificent descriptions of our immortal bard, whilst he is describing the progress of the creation:—

"Forth flourished thick the clustering vine, forth crept
The swelling ground, up stood the corny reed
Embattled in her field, and the humble shrub
And bush with frizzled hair implexed; last
Rose as in a dance the stately trees, and spread
Their branches hung with copious fruit, or gemmed
Their blossoms, with high woods the fields were crowned,
With tufts the valleys, and each fountain side;
With borders 'long the rivers."

Let us view then all these, and far more than these, and then say with some that He exists not!

"Sunt, qui fortunæ jam casibus omnia ponant,
Et nullo credant mundum rectore moveri,
Natura volvente vices, et lucis, et anni
Atque ideo intrepide quæcunque altaria tangent."

It is for us, then, to trace the principles of design of the Almighty Creator, it is for us to search into, and gain that benefit, which all around us is so capable of affording, and we, at least, shall exclaim with the poet,

"These are thy glorious works, Parent of good,
Almighty! thine this universal frame
Thus wondrous fair."

OBSERVATOR.

ON THE MIGRATION OF BIRDS.

BY T. C.

THERE is no subject connected with birds more interesting or more wonderful than their migration: so wonderful is this habit, that it has given rise to much discussion, and diversity of opinion; and notwithstanding the numerous proofs which have been advanced in favour of this beautiful and astonishing habit, many are yet unconvinced, or are so bigoted to their own opinion, as to be inconvincible.

There is no greater obstacle to the acquisition of knowledge than that prejudice, which is often so deeply rooted in some narrow minds (and that too, without consideration or examination of facts), that it is almost impossible to eradicate it, or to convince them of their error; how clear soever may be the proofs brought forward in opposition to their favourite theory.

Since I troubled you with a few remarks on the migration of swallows, and which appeared in your number for January, I have been informed that, "there is abundant proof of the swallow's remaining in a state of torpidity," and also that "this fact is well known." I have therefore been induced to trespass upon your patience with a few more remarks upon the subject, though I must confess that I think the migration of swallows is now generally acknowledged.

The accurate and intelligent observer, White of Selborne, however, evidently inclined more in favour of torpidity than of migration, as appears in many places throughout his interesting letters. He says, "It is very remarkable that after the *hirundines* have disappeared for some time, a few are occasionally seen again; sometimes in the first week of November and that only for one day. Do they not withdraw, and slumber in some hiding place during the interval? &c. Speaking of the sand martin, he observes "it is easy to suppose that they may, like bats and flies, have been awakened by the influence of the sun amidst their secret *latebræ*, where they have spent the uncomfortable foodless months in a *torpid* state, and the profoundest of slumbers."

Now as I have already observed, it is possible that these individuals may have retired to some hole, and there remained in a state of *slumber*, but this is no proof that this slumber was *torpidity;* and it is possible

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* The alleged evidence for this I have given in "Faculties of Birds."—ED.

that the unusual warmth of the weather might have awakened them; but had it not been for this timely fair weather, they would no doubt have perished.

And it is also very probable, as Mr. White himself observes, that they "spend their time in deep and sheltered holes, near waters, where insects are more likely to be found."

I will not occupy your pages (should you deem this worthy of insertion) with further quotations; suffice it to say, that both White and Markwick advance numerous facts in favour of torpidity, but they appear to consider, not that the *whole tribe* of swallows remains in a torpid state, but that individual birds only have been found. Now, I do not doubt, that, "after the *hirundines* have disappeared for some weeks, a few are occasionally seen again, and that only for one day," and it is most probable that "they withdraw and slumber in some hiding-place during the interval;" but *torpidity* is a very different thing, and if we allow that swallows have been found in a state of real *torpidity*, we must allow that the swallow is capable of enduring torpidity, and we may very justly observe that if this power has been given, it must have been for some express purpose, and why does not the whole tribe remain in that state? but we have abundant proof that this is not the case.

Markwick says "Of their migration, the proofs are such as will scarcely admit of a doubt. Sir Charles Wager and Captain Wright *saw* vast flocks of them at sea, when on their passage from one country to another." And Mr. White himself gives an instance of what he considered actual migration; in fact that the swallow is a migratory bird is seldom doubted; and indeed what reason is there for doubting it, when so many heavier and shorter winged birds are known to migrate; the only doubt upon the subject is, that *some* swallows remain in a torpid state; and this I deny for reasons stated above; but this will be much better explained by referring to an excellent note by Sir W. Jardine, in White's Natural History of Selborne.

The swallow is a very peculiar bird; I have seen it busily employed in building its nest under an ornamental swing bridge, in a garden, and so low that a person could but just pass under sitting upright in a boat. White says "they do not enter, like the house martin, the close and crowded parts of the city;" this is not the case in the present day, for they are quite as common in the city as the martin, and frequently *build* in the "close and crowded parts."

Before departure this bird assembles in large flocks on house-tops, and frequently on trees, and indeed is often seen to perch upon trees, generally the topmost branches. From its being frequently seen on trees growing near waters, it has been supposed to spend the winter immersed in that element: an enviable berth truly! like the poor swift from July to April, "to *rest* after so rapid a life," as Mr. White observes!

P. S. The cuckoo to which I have twice alluded, is dead, after being kept for five months, and without ever having evinced any desire to slumber, more than is usual amongst all animals.

Had it been properly attended to, and kept warm, it would no doubt have lived through the winter.

ON THE ROOT OF AN ASH TREE.

BY R. T. C.

A FEW days ago I was riding through South Runcton, a village near Lynn, in Norfolk, when my attention was drawn towards an ash tree root of remarkable length, the history of which I subsequently learnt. The tree to which this root belonged had yielded to the axe some two months ago.

It is known that the roots of most trees, if embedded in a soil favourable to their habits, will extend themselves a considerable distance from the trees themselves. Du Hamel states, that he found the tap root of an oak, which measured four feet in length, the stem of the tree being only six inches high. The ash, I conceive, under ordinary circumstances, produces the longest root of any forest-tree growing in Great Britain. Farmers in general, who have the opportunity, fell the ash, if growing in the hedge-rows of corn-fields; because, say they, its roots run a long distance near the surface, thereby injuring the corn growing within the range of their baneful influence. Whether the roots of the ash excrete a deleterious matter, which acts upon the rootlets of the corn-plants within their reach, or whether they draw so much nourishment from the soil, that sufficient food is not left therein for the healthy support of the corn-plants, I have no means of ascertaining; probably, each contributes its share of the ills experienced by the agriculturist, whose corn-field fences are encumbered with ash timber. Large timber trees of all kinds overhanging corn-fields, doubtless, are

injurious to the corn growing within the spread of their branches, even if no excrementitious matter is ejected by their roots, and that their roots penetrate too deep into the earth to draw nourishment from the soil in contact with the rootlets of the corn. Light and exposure to the passing breeze are necessary to the rearing a good crop of corn, as they are to the production of wide-spreading, useful, and ornamental timber. But to the root under notice.

A portion of the root reposes on the undulating surface of a meadow near the road's-side, furnishing daily conversation for those travellers whose attention may be directed towards its extraordinary appearance. The root was divided into three parts by the workman employed to fell the tree, and the greatest circumference, of that part detached from the trunk of the tree, was about three feet; its length about twenty feet; the second and middle part was taken from the soil, and measured ninety-five feet in length; its greatest circumference measured eighteen inches; the third part was severed at the distance of one hundred and fifteen feet from the trunk of the tree, and took a zig-zag direction through the space of eighteen feet, making the entire root one hundred and thirty-three feet in length. When in its natural position, its distance under the surface soil was from one foot to one foot and a half. The tree itself was about forty-five feet in height; it grew on a poor sandy soil, on the brink of a rivulet; its age was from ninety to one hundred years; and it contained about two loads of timber.

Shouldham.

NOTES FROM THE ISLE OF WIGHT.

BY S. W.

About six weeks ago, a countryman brought me a specimen of the Night-Jar, which he had just taken. He fell in with it suddenly, by a hedge-side in his field. The sun was shining brightly at the time, and he thought that the bird was asleep: it was probably dazzled by the glare, as he caught it in hand without its attempting to escape. It appeared perfectly uninjured when brought to me. I am not sufficiently acquainted with the species to know its age, but a want of full plumage under the wing makes me suppose that it is a young bird. It could not fly perfectly, alighting, after having flown about half across a field,

and suffering itself to be retaken. It refused to take any food; but was fed by having very small pieces of raw meat forced down its throat. It has been kept alive, and in apparent health, ever since by the same means; being fed in this way every evening. It seems to be stronger than when it was originally taken, but not at all less shy. It will not feed itself, either by pecking from the hand or from the floor of its cage; water has been put into its cage in an open saucer, but it does not appear to make any use of it, either in washing itself or drinking. Can you, or any of your correspondents, suggest any way of managing it, which may tend to tame it, or any mode of feeding which may lead it to provide for itself?

In the next parish to this there is a Gull (either the *Larus hybernus* or *L. Rissa*) which was brought up there about twenty-seven years ago. There is a small piece of water which it used to frequent; but for many years it has nearly forsaken this, and spends its time, either sitting upon the rails of one or two cottages to which it confines its visits, or flying at liberty around the country. Every spring, when the breeding season arives, it leaves the parish, which is inland, and pairing with one of the wild birds, inhabits the white cliffs on the coast, whence it returns again alone when the breeding season is over, after disappearing, however, for some days to either. It is so tame at other times with those whom it knows, that it will come into their cottages and eat out of their hands, but will not be approached thus closely by strangers.*

A few months since, a peasant brought me alive, a female Kestril and a Magpie, which he had captured in a singular manner; whilst working in a field he heard a great scuffling on the other side of the hedge, and upon looking over, saw the Kestril and Magpie fighting on the ground. He got over the hedge, and approached them; the Hawk endeavoured to escape, but the Magpie held her so firmly by the leg, which he had grasped in his claw, that she could not escape, and both were taken with the hand. The Magpie was very much wounded about the head, and died in the course of the night. The Hawk did not appear to be hurt; but she refused all food, and did not live long. She had lost one eye in some former battle, but the socket was quite healed and dried up.

B—— Rectory.

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* This is an exceedingly curious, and, so far as I know, a very uncommon fact.—Ed.

NOTES ON BIRDS.

BY T. C.

As every fact connected with Natural History is worth recording, simply because it is a *fact*, and as a perfect history is only a collection of such facts, I have not scrupled to hand you a few observations or rather remarks, which, though insignificant in themselves, may be interesting to those, to whom they are new, and may form small parts of one great and perfect whole,—as the more of such facts the history of any animal contains, the more nearly it must approach to perfection.

The Redbreast, though seldom seen in densely populated districts in summer, is very common in winter; this is not so much owing to the inclemency of the season, as to his partiality to the society of man, for it is only when engaged in the duties of incubation or rearing his family, that the Robin returns to more secluded spots, and about the middle of August he approaches our dwellings*. At this season he sings very late in the evening; I have often observed him seated on some projecting corner of the roof, singing for hours together, and that when the moon shone brightly, and the sun had sunk far beneath the horizon. The wren and blue tit also frequently visit the outskirts of London in the winter, and the common wren is exceedingly plentiful in the country surrounding the metropolis. Markwick notices young goldfinches on the 15th of June. White on the 15th of August. I have seldom seen them till the 1st of August, but they are not plentiful till the middle or end of the month.† I have seen a nest on a cherry-tree, with only one or two eggs in it, at the beginning of July.

The black begins to appear on the head of the young goldfinches about the middle of September, and the red at the end of that month. On one which I kept, the black first showed itself on the 1st of October, and was perfect on the 1st of November, the face was covered with a dull orange, much mixed with black; it is some time before the head assumes its perfect colouring. The goldfinch has many of the manners of the tits; it is very active and lively, frequently hangs with its back downwards, and will put its feet on its food, and peck at it like a genuine *parus*: it is amusing to see it with a teazle or thistle, leaning upon it and pulling out the seeds.

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* This remark is not quite correct. See ARCHITECTURE OF BIRDS, page 83.

† There are more broods than one. I have seen the young as early as the end of May, and eggs as late as September.—ED.

I have already noticed the brown plumage of the young starling, but in adult buds there is some variety, owing chiefly to age, but sometimes I think it is accidental, some having the plumage more glossy than others; these are the old ones; but some have no white specks on the throat and neck, which are very much glossed with purple. At the British Museum there is a handsome variety, were it not so badly preserved; the birds there are certainly a disgrace to the institution. The bill of the young starling is always dark horn colour, but in the old bird it is sometimes yellow; is this the effect of age or season? I have never seen the yellow bill in winter.

The common sparrow, though an artful bird, is by no means shy; there was a nest on an elder-tree in St. James's Park, very few feet from the ground, near which a sentry was constantly on duty, besides the numerous visiters who were passing and repassing beneath it all day. In Corinthian capitals, and in *bassi-relievi* it frequently builds, though quite as frequently in *trees*, and it is probably only the scarcity of trees in towns, which makes the bird appear so fond of building in houses, &c. At the Zoological Gardens a few years ago, this bird had constructed her nest between the wire roof of the Condor's cage and the thatching of the building, by no means alarmed at the presence of her formidable neighbour, through whose apartment she frequently flew, secure in her insignificance.—Sparrows both *wash* and *dust*.

The greater redpoles (*Fringilla cannabina*) and the grey linnet (*F. linota*) are one and the same bird, but the twite (*F. montana*) is a distinct species, the upper tail coverts of which are red, but this is seldom obtained after moulting in the cage; it has a ludicrous chattering note, quite unworthy the name of a song.

White notices vast flocks of hen-chaffinches at Selborne about Christmas. In the North of England I have seen them about the end of September, probably on their way southward, but near London the males are as common as the hens in winter.

On the 22nd of last September I noticed some black caps, feeding eagerly on the fruit of the elder-tree. Was not this rather late in the year for them*?

Does the cuckoo leave us so early as has been said? I am persuaded

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* At Bonn on the Rhine I had a nest of young blackcaps in my garden in September.—Ed.

that the young ones do not, for I have seen one long after that time; (July). Is it not that the bird being no longer *heard* is not noticed?

In Montagu's Ornithological Dictionary, 2nd edition, is the following passage by the editor:—

"In the Edinburgh edition of Wilson's work, the first volume of which I have just seen, Dr. Jamieson says in a note to the sea eagle (*F. ossifragus*). 'This is the young of the *Falco leucocephalus*, or white headed eagle, not the young of the *F. albicilla*, or cinereous eagle, which is the sea eagle of Britain;' he does not say upon what grounds he has come to this conclusion, in opposition to the best authorities upon the subject."

Now Dr. Jamieson means, that *the bird, described by Wilson* under the name of *Falco ossifragus*, is the young of the white-headed eagle, and not that the English sea eagle, formerly described under the name of *F. ossifragus*, is the young of the white-headed eagle.

This is perfectly correct; the similarity of the young of both species has led to their being described as one bird, under the name of *F. ossifragus*, which bird does not now exist, the English being the young of the *F. albicilla*, and the American the young of the *F. leucocephalus*. I have not seen the last edition of Montagu's excellent work, and should this passage be omitted in it, of course it is needless to notice it here.

ON TAME NIGHTINGALES.

BY ORNITHOLOGUS.

It has long been a subject of regret, that, among the various publications of the day, no periodical should have made its appearance, exclusively devoted to natural history, wherein the observations of those, whose attention is directed to the phenomena of nature, might be communicated to that portion of the public, who take an interest in one of the most delightful and innocent studies that can occupy the mind of a reflective being. This blank in our national literature has now been supplied, and I beg leave to congratulate you, no less on the design of your publication, than on the manner in which it is conducted. I am, myself, an ardent admirer of nature's wonders, but my attention has

been chiefly directed to the manners of birds, of which I have now several varieties by me.

The charming Philomel, is, of course, the prime favourite; and, as I have had two nightingales constantly under my eyes for a long time, I trust a few remarks will not be deemed intrusive. One of these birds was taken on the 19th of April, 1832, and has been in good health nearly ever since. He did not, however, commence his song till the end of March, 1833, and even then he never appeared to warble "his native wood notes" in full perfection. The other I brought up from the nest, and as I had it when only a fortnight old, it is so perfectly familiar, that nothing seems to alarm it. It began to record its song when five weeks old, and has continued to improve till now, when its song is almost perfect. During the summer and autumn, this bird was very amusing from its dexterity in catching flies, which, on appearing in front of his cage, immediately fell victims to his quickness of eye, and rapidity of movement; in this manner he must have destroyed nearly two hundred *per diem*. He now sings nearly all day, and what is remarkable, when the room is lighted up for the evening he seems most cheerful, and sings with most animation,

> "In his sweetest, saddest flight,
> Smoothing the rugged brow of night."

Thus have I enjoyed one of the greatest delights of spring through the dreary season of winter. I was aware that these birds would sing in confinement at night, during the summer, but am somewhat surprised that my bird should do so in winter. It is remarkable that these birds seldom roost with the head under the wing; at least, I have never seen my other bird (taken when old) in that position. This is, perhaps, the reason, why they have been supposed never to sleep, but my young one frequently assumes that posture, starting from it sometimes suddenly, and resuming his song as if he had been actually dreaming, which Buffon asserts they do. If placed in an obscure corner of the room they become very restless, but resume their tranquillity if brought nearer the light.

I am informed, that, in some parts of Germany, nightingales may be seen hanging from the windows, as common as canaries are in England. If this is the case, (and it appears very probable from the number of German canaries, imported, singing the nightingale's note) I should like much to ascertain the food on which they are kept,

as our German friends have most likely some less extravagant food for them than egg and meat, which are alone found to answer the purpose here. The great difficulty is that the food must be moist, as they seldom drink; one of mine lived, I should think, for a month without water, but then the food was very moist. Perhaps some of your correspondents can suggest an efficient substitute, as I have not yet succeeded in discovering one. I find I have so filled my paper that I have no room for an interesting anecdote of the hawfinch, which I had intended to communicate; if, however, the above is deemed worthy of a place in your Magazine, I will not fail to forward it shortly*.

Gravesend, Jan. 8th, 1834.

GEOLOGICAL POSITIONS†

IN DIRECT PROOF OF AN IMPORTANT PART OF SCRIPTURE CHRONOLOGY.

FIRST LINE OF ARGUMENT.

1. The chalk is a marine formation, and consequently was deposited as a sediment, in the bed of the sea‡.

2. As the chalk now forms an extensive member of the secondary strata of our dry lands, there must have been a time when it first became dry land.

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* In Germany, they feed their nightingales, from May till September, almost wholly on ants' eggs, which are regularly sold for this purpose, and are also dried for winter food; but in winter the chief food is German paste. Live meal worms are also given them, to the number of twelve a day, during their time of singing. I myself purchased, at Cologne, about ten thousand for a sovereign, and have now, I should think, a million or more. Full information on all these points is given in Dr. Bechstein's work on Tame Birds, now in the press. See also Field Naturalist, vol. i. page 224.—Ed.

† This singular paper has been sent to me, in print, without any name, or printer's imprint.—Ed.

‡ The chalk formation is here selected for the establishment of the following positions, from its very marked features, and from the facts on which they are founded having been first remarked on the chalk coasts of France and England. But the argument applies with equal force to all other secondary formations, acted upon by the erosion of the sea.

3. The actions of the waves upon a sea coast is unceasing, and the effects of this action are more or less visible on every shore, according to the consistency of the rocks which compose it.

4. From the very first moment that the chalk became dry land, this unceasing agent must have operated as it still does, upon such portions of it as extended to the level of the sea.

5. From that time to the present, is the exact age of the chalk, as a dry land.

6. The chalk is never superficially level, but is, on the contrary, invariably of a rounded and sloping surface.

7. The surface of the chalk is always grooved out into valleys, divided by ridges of various degrees of steepness, but invariably smooth.

8. These valleys seldom contain water, or running streams; they, consequently, have never been altered in their surface by the erosion of rivers, since they became valleys.

9. Notwithstanding this absence of rivers, the chalk valleys universally open either into larger valleys which lead to the level of the sea, or they individually point to this exact level, thus plainly bespeaking the action of waters.

10. As all chalk valleys, unaffected by the corroding action of the waves, have this character and tendency, we are certain that all other valleys, though now cut short by precipitous sea cliffs, had, originally, the exact same form and tendency.

11. Our present chalk cliffs are constantly encroaching upon the lands, by a progress more or less rapid, according to circumstances.

12. As rotundity is a universal characteristic of the chalk, and as the cliffs will thus all be higher, and further back a thousand years hence, than they now are, it follows that they were more in advance, and consequently lower, a thousand years ago.

13. Having the perpendicular of the cliffs, and the angle formed by the hypothenuse with that perpendicular, we can have no difficulty in correctly ascertaining the length of the base.

14. The length of the base is the exact amount of space destroyed by the action of the waves, since the chalk first became dry land.

15. The length of the base being ascertained, and also the rate of decay per annum, we are led with certainty to the number of years which have elapsed since the erosive action first commenced.

16. As this action is unceasing, and as the chalk is peculiarly

affected by it, it never could have been in full force, even for a single century, without occasioning a cliff.

17. As no such cliffs exist, from top to bottom of the whole chalk formation, except those now in progress on the sea shores, the sea never could have acted upon the chalk for any length of time, except on its present level, as compared with the chalk.

18. We are thus forced to the conclusion that to whatever elevation the chalk may extend, (and it is upwards of 1000 feet in England,) the whole mass was either raised at one time from the bosom of the deep, or the deep was depressed, at the same individual period, so far below its former level.

19. No stratum now reposing on the chalk above the level of the sea could have been deposited in the sea, since the present cliffs were begun.

20. The whole series, therefore, of what are usually termed Tertiary Strata, reposing on the chalk, were formed in the sea previous to the elevation of the chalk, and were elevated along with it, at the very same period.

21. Assuming 900 yards as the mean extent of decay on the chalk coasts of both sides of the British Channel, (as indicated in the thirteenth position,) a waste of eight inches per annum gives four thousand years as the age of the chalk as a dry land.

22. As eight inches is above the general average decay of chalk cliffs at their present height, so it must have been greatly below the real amount during the first two thousand years of the operation, and may be considered as a fair general average of the whole.

23. As the action of the Falls of Niagara in the midst of the great marine formation of North America, brings us exactly to the same period of about four thousand years; as we are, in neither case, able to extend the calculation much beyond that period; and as both coincide so exactly with what Sacred History and the traditions of all nations have handed down to us, we may look upon these latter as being most fully confirmed, as to the great and preternatural event to which they both bear witness.

24. As we know of no law of nature by which the chalk formation, and the tertiary strata reposing upon it, could have been raised, at one time, above their native element, we must conclude that this effect was the result of a preternatural power, and of an Almighty decree.

25. We are thus forced to admit a more powerful Agent into our

systems of Geology than the mere laws of nature, to which all phenomena are generally referred; and the science is thus placed upon a new, a more solid, and more consistent foundation *.

SECOND LINE OF ARGUMENT.

1. A river consists of the fresh waters of a district, seeking their level in the waters of the ocean.

2. Rivers usually flow in valleys to which their own size and force bear no sort of proportion, and which must, therefore, have been formed by an agency distinct from that of the waters now flowing through them.

3. These valleys must have been scooped out by a force, similar to that of which we have distinct proof in the valleys of the chalk districts, which have never been occupied by rivers. We are also certain of this having been an aqueous agent, from the well known fact of their always ending on the exact level of the ocean.

4. All valleys occupied by rivers terminate at length in this general level, in the same manner as the chalk valleys, without rivers, once did, though these latter are now often cut short by sea cliffs.

5. The bed of every river is a plane, more or less inclined, according to circumstances.

6. As we know that the corroding action of the sea is incessant, and consequently that all sea coasts have been gradually encroaching on the lands, from the very first moment that they became sea coasts; as we also know with certainty, that, at the period when this action first began, the valleys must all have terminated, as they still do, in the exact level of the sea; we have a right to conclude that the time cannot be very distant when this corroding action first began.

7. If we assume that the general average decay of a coast is but one foot per annum (and it will not be denied that it is considerably more upon a large proportion of coasts); and if we take so short a period, (geologically speaking) as only one hundred thousand years, we must suppose that more than eighteen miles have been lost, from the original mouths of all rivers.

8. Had this been the case, we must have found a waterfall, or rapid,

* A detail of the facts on which the above positions are founded, has been sent to the editors of the London and Edinburgh Philosophical Magazine and Journal, in which work they will probably soon appear, in the form of two papers.

at the mouth of every river; and, consequently, all inland navigation from the sea must have been impossible, except in perfectly flat countries.

9. As we rarely find such falls, or rapids, at the mouths of rivers, and as we have reason to know, on the contrary, that their originally inclined planes have neither been materially altered in inclination, nor shortened in extent, we must conclude, that the loss of land on all sea coasts has, as yet, been but small, and, consequently, that the unceasing action of the waves has been but of recent origin *.

10. As the superficial slopes of all hilly countries lead the eye, in a regular line, to the level of the sea, in about one mile, (more or less, according to the consistency of the shores,) we cannot avoid the very same conclusion which we have before attained in a more exact manner, in the instance of the chalk; viz. that all our present sea coasts have been acted upon by the sea but a very few thousands of years, and, consequently, that all existing dry lands were elevated above the level of the ocean, at the same recent period.

VULTURES, (*From Le Vaillant's Birds.*)

(VULTUR,—*Cuv.*, *Vieill.*, *Temm.*, *Briss*, *Linn.*, *Lath.*; EGYPIUS, *Savig.*)

PRINCIPAL CHARACTERS.

Bill straight, longish, flattish at the sides, convex on the upper part, thick or slender; *upper mandible* covered with a cire at its base, and curved only towards the point; the *lower* straight, rounded, and inclined at its point; *nostrils* naked, crescent-shaped or rounded, transversal or longitudinal. *Tongue* channelled, bordered with points or without points, indented at its extremity. *Mouth* cleft almost as far as under the eyes. *Shanks* reticulated. *Toes* four in number, warty underneath, three in front, one behind; the outer ones united at their base by a short membrane; the intermediate very long; the hinder articulated at the base of the shank in the same manner as the anterior. *Claws* slightly arched.

* It is stated by a recent and very able writer on this subject, (but who advocates an unbounded theory of Chronology) in treating of the action of the sea upon its coasts, that, on the coast of Yorkshire, four yards a year is the rate of decay. This loss, for only one million of years, amounts to no less than 2272 miles; and even at one yard of annual loss, Yorkshire must once have extended 568 miles further eastward than it now does.

ACCESSORY CHARACTERS.

Wings long; the first quill shorter than the sixth; the fourth longest. The crop forming a projection above the fork bone, and covered with a thick down. *Head and Neck* partly destitute of feathers; prominent eyes.

Vultures have a very sharp face (*facies bien tranchée*) this character is peculiar to them, and distinguishes them from all kinds of hawks. They are dastardly, cruel, and voracious birds, and feed much oftener on offal than on living prey, for putridity and infection will attract rather than drive them away. In hot countries, as Egypt for instance, where they are in vast numbers, they render the inhabitants an essential service, in purging the land of many noxious impurities, the remains of carcases, which, in becoming putrid, would empoison the atmosphere. The structure of their legs does not permit them to make use of their talons for the purpose of carrying off their prey; they convey the food destined for their young in their crop, which is very capacious, and thence disgorge it into their bill on their arrival at the nest. Their sight is exceedingly keen, and their sense of smell is perfect to the highest degree; they discharge a fetid matter from their nostrils after feeding; their crop forms a large prominence above their fork-bone. The mouth is simple.

Vultures are the only birds of prey which live and fly in flocks; they construct their nests among the most inaccessible rocks.—SAVIGNY.

THE ORICOU (*Vultur auricularis*).

L'Oricou, *Le Vaill.*, Ois. d'Afriq. i. p. 36, pl. 9; *Shaw's* Zool. vii. pl. 10; Vultur auricularis, *Lath.* Ind. Orn. Sup. p. 1; *Daud.* Orn. ii. p. 19; Sociable Vulture, *Lath.* Syn. Sup. 2d, p. 11; *Id.* Gen. Hist. i. p. 20.

THIS species is larger than even the largest of our vultures, it being ten feet across the wings from tip to tip. It presents one of those striking characters which I think so useful for the purposes of nomenclature; it is a membrane of four lines in thickness, which encircles the front of the ear, and is then continued in a straight line upon the neck. This kind of raised concha is four or five inches long, and must necessarily improve the faculty of hearing in this species. The entire head and one half of the neck are naked, and of a flesh-red colour, assuming a violet-blue tint towards the beak, and a whitish one towards the ears; a few short and sparse hairs are only to be seen on this coloured skin. The gorge is black, and is covered with rigid hairs of the same colour. All the feathers of the upper part of the body, together with the wings and tail, are of a dull brown colour, but tinged with a lighter shade at the borders; those of the back part of the neck are curved backwards and upwards, forming a sort of cravat, in which the bird, by drawing in its neck, conceals all that part of it which is bare of feathers; it is especially during the digestion of its food that

the bird assumes this most disagreeable attitude. The craw, which protrudes very much, is covered with a fine glossy down of a silky texture, but altogether not unlike the wool of quadrupeds. The entire body, from the breast to the tail, is covered with long narrow feathers, extending from the body in proportion to their length; they are sabre-shaped, of a pale-brown colour, bordered with whitish grey. The thighs and one half of the shank are covered with a very fine white down, presenting a slight shade of fawn at the lower part. The same down also clothes all the under part of the body; it is also visible between the feathers of the breast and on the sides of the neck. The tail is tapering, and is always worn at the end. The base of the beak and the skin surrounding it are of a yellowish horn colour; the feet and toes, very large, are defended with large brown scales; the nails broad, and but slightly arched, are, as well as the end of the beak, horn-coloured. The eye is encircled by long black lashes, and the iris is of a chesnut brown.

This vulture, like other species of this genus, is a mountain bird: it forms its habitation in the caverns and other places of shelter met with in rocky localities. These birds there pass the night, and there repose during the day, after feeding. Great numbers of them may be seen at sunrise, perched upon rocks at the entrances of their dwellings; sometimes they may be seen thus occupied, dispersed over the greater part of an entire range of mountains.

These birds are always found to have their tails much worn; this is from their rubbing them against the rocks, in the interstices of which they squat, or upon the tops of which they roost: but eagles, seldom alighting on the earth, or perching upon trees, preserve theirs more entire; besides this, vultures use the tail also against the ground on the plain, for they do not take flight suddenly, but after a short run and forcible contraction of their members. The flight of vultures is not, however, less powerful and lofty; they rise to an immense height, and totally disappear from the eye. It is astonishing that these birds, themselves invisible, should perceive what passes on the earth, and distinguish such animals as serve them for food, plunging down upon their prey, in great numbers, the moment death has delivered it up to them. Should a hunter kill any large game, which he cannot immediately carry off, and leave it for a short time, he will not find it at his return; but he will find a flock of vultures, and that too in a place from which a quarter of an hour before not a single one could be perceived.

This is a fact, which I have on several occasions, in the course of my travels, experienced on the part of vultures, whether of the present species, or of others which will be described hereafter; for all voracious carnivorous animals mix with each other under such circumstances. The first time I was their dupe was at a time when I was labouring under a scarcity of provisions, and, consequently, the lesson which they gave me made a very sensible impression. I had killed three zebras: satisfied with my sport I returned to my camp, from which I was at a league's distance, and ordered a wagon to bedespatched to bring them away. My Hottentots, better informed than myself, told me, that the journey appeared to them quite useless, as the zebras would be devoured before our return. However, we set forth; but we had not advanced far, before we saw afar off the air filled with vultures. At our arrival, we found them strewed over the plain; the zebras were devoured; the only remaining vestiges of them were large bones; vultures moreover were still arriving, and on all sides there was an astonishing assemblage of these animals in motion, of which I could reckon more than a thousand. It was curious to observe with what rapidity such an immense number of vultures could be so soon collected. I one day hid myself in a bush, after having killed a large gazelle, and left it on the spot. In an instant crows came, and, croaking loudly, jumped upon the animal; in less than a quarter of an hour, hawks and buzzards arrived; a moment afterwards, raising up my head, I perceived birds at a prodigious height, and, which, wheeling around, were rapidly descending. I was not long in recognising them to be vultures. From their appearance one might have supposed that they had escaped from a cavern in the sky. The first were not slow in pouncing upon the gazelle; I did not allow them time to tear it piecemeal; I hopped out of my hiding place; they heavily retook to flight and rejoined their companions, who were visibly increasing in number, and who seemed to fall from the clouds to participate in the prey; but my presence quickly caused them all to disappear in the air.

The following seems to me to be the way in which vultures are called to share in any prey: the first carnivorous birds, which discover a carcase, give an alarm to the others in the vicinity, as much by their screams as by their movements. If the nearest vulture should not observe the prey, from the high region of the air in which he is floating, he discerns, at least, the inferior land birds of prey who are preparing to feast on it; but it may be the vulture's sight is sharp enough to dis-

cover the body itself. He descends then rapidly, and in circles; his descent is understood by other vultures who observe it, and who have, doubtless, a thorough knowledge, and practised instinct, upon whatever relates to their food. In the neighbourhood of the carrion, there is then formed a concourse of carnivorous birds which drop from the clouds, and are certainly sufficient to attract vultures from every part of the country, in the same way as several men, by running in the streets, would draw a crowd together.

From the congregation of vultures towards a given spot, we may sometimes infer the proximity of the lion, tyger, or hyæna; for, when one of these animals has killed a large quadruped, the vultures, who have observed him, immediately arrive, and bring after them a train of others, which warns the traveller to be upon his guard. These timid and dastardly birds, wanting the courage to dispute a prey, evince on this occasion all the baseness of their character; for not daring to make use of their force, weapons, bulk of body, advantage of flight and even of numbers, which make even cowards valiant, keep at a respectful distance from the ferocious animal, wait until he has finished his repast and retired, and then devour the abandoned fragments.

The Hottentots and colonists of the Cape of Good Hope, well informed by experience of the ability of vultures to discover the bodies of animals, and also their voracity, never leave what they have killed, without concealing it, generally beneath a heap of leaves and branches; sometimes they cover it over with a pocket-handkerchief, or waistcoat; but, in spite of these precautions, it often happens they find nothing more than a mere skeleton at their return; for the crows, who are of a bolder temper, first of all search out the animal, and the vultures, then venturing to approach, in a short time entirely devour it.

The Dutch colonists of those districts which the oricou inhabits, give it the name of *swarte-aas-vogel*—the black carrion vulture. They call it black, to distinguish it from another species of vulture of paler colours, and which I shall describe in the following chapter, under the name of *Chasse-fiente;* a name which it has at the Cape, where it is also called by the inhabitants *stront-jager*. All vultures are generally known at the Cape by such names as *stront-vogel*, *stront-jager* or *aas-vogel*.

I never observed the oricou in the environs of the Cape; it is very common in the inland districts, especially towards the country of the Great Namaquais, where the other species is also found.

It builds in rocky caverns. The female lays two white eggs, and sometimes, but very rarely, three. In October these vultures begin to pair, and in January the young ones are all hatched. As they live in very large flocks, a single mountain will contain as many nests as it has places adapted for them. It is worthy of remark, that vultures never build on trees, at least in Africa; and I am very much deceived if they do in any other part of the world. They appear to live together in great harmony; for I have sometimes seen in the same cavern as many as three nests side by side.

During the period of incubation, each male stations himself as sentinel at the mouth of the cave in which his female is sitting: a circumstance from which it is easy to discover the situation of the nest, which on the other hand is almost always inaccessible. I have, however, by the assistance of my Hottentots, occasionally vanquished all difficulties, and often risked my life to examine the eggs of these birds; their dwellings are disgusting, and infected with an insupportable stench. To approach these obscure retreats is attended with great danger, as the entrance to them is covered with dung, which is always in a fluid state, from water which continually filters through the cracks of the rocks: so that in happening to slip on one of these rocky points, we run the risk of falling down the frightful precipices above which these birds usually establish themselves.

I have tasted the eggs of the oricou as well as those of the chassefiente, and found them very good for use.

At its birth, the young oricou is covered with a whitish down. On leaving the nest, its plumage is of a pale brown, and all its feathers are tinged with red on the borders: those of the breast and belly are not yet sabre-shaped, and its head and neck are entirely covered with a fine thick down, and the stripes round its ears are hardly perceptible; which often misleads inexperienced naturalists, and induces them to consider it as an eagle, or vulture of a different species; though it is not difficult to distinguish a vulture from an eagle by the form only of the claws—a character much more decisive than that of a bare head, which in all vultures, while young, is covered over with down. In this way, who can point out in the numerous works on birds all the young vultures which have been regarded as eagles, although there is nothing more easy than to distinguish a young from an old bird? But on this subject, I repeat, that a single glance from an experienced naturalist is unquestionably worth more than the scrupulous testimony of all those

numerous and general characters, which, for the most part, only exist in the imagination of him who established them, and are seldom suitable to two species of the same genus. The Grands Namaquas call the oricou *ghaip*, preceding the word with a loud clap.

M. BIOT ON THE SAP OF PLANTS.

In all my experiments, the motion of the sap appears to me to proceed from the eminently *hygroscopic* quality of the vegetable tissue. The sap received at the roots evaporates by the leaves, whilst between these points the vegetable tissue acts precisely as a cylinder, composed of animal charcoal, covered with an impenetrable envelope, and with its lower part immersed in liquid. The column is thus supplied with all the liquid that it can contain; the vegetable tissue becomes itself in the state of saturation that suits its mass under the existing temperature. This kind of equilibrium being established, should any cause, a sudden change of temperature for instance, increase the evaporation at the extremity of the branches, these will act by suction; draw more from the roots, and the equilibrium is still preserved. Should, however, the roots come to furnish more, and the leaves evaporate less, then will ensue turgescence in the vegetable tissue; and if a hole be made, the sap or liquid will overflow. This is precisely what is observed in the birch tree in spring, when its sap begins to rise, and before its leaves have come forth, or are able to perform their task of evaporation.

As another trait of resemblance, it may be remarked, that the lateral action of heat on any hygroscopic column, such as we have represented the vegetable tissue to be, would have the effect of rendering it capable of less saturation, and, consequently, would oblige it to throw out a part of the liquid it contains. This is the effect which the sun produces upon the birch, and upon other trees, whose sap runs out at this period. When the leaves come these phenomena cease; the task of evaporation is performed, and the sap bursts neither from the bark, nor through an orifice, if made.

Now suppose we replace the impermeable or air-tight envelope by one, on the contrary, capable of absorption from within, and exhalation from without, the state of things will be changed. The issue of the sap or liquid, by the sides of the envelope, will be more frequent

and facile. The diminution of the exhaling power by a sudden cold will favour it, and the sap will burst forth at once from all the pores of the tree equally, taking into account merely the different degrees of thickness in the bark. Such is an account of the emission of sap by the sides of the nut tree and sycamore, in spring.

The influence of the leaves on the internal motions of the sap in trees being thus explained, let us observe what will be the consequence, if these leaves, or great evaporating organs, be enveloped with a colder atmosphere. The sap conveyed to them being no longer evaporated, will rest and collect on their surface, and check all evaporation, especially at night. The upper parts of the vegetable tissue, or hygroscopic column, being thus overcharged, will let fall their superabundance upon the parts that are lowest, which will produce a descent of the sap. Hence proceed the alternate ascent and descent of sap, such as have been noticed. Moreover, these effects will become continuous, if the evaporating property of the leaves should diminish before the supplying power of the root ceases to throw up the sap; and this is precisely the case in September: the same trees that afforded me but their ascending sap in the spring, in September afforded a continual sweat. The latter was no longer the same as the spring sap, for it contained no saccharine principle.

M. Biot concludes from his experiments, that the alimentation of the foliaceous organs is accomplished principally during the day; whilst the alimentation of roots, and the formation of new layers of them, is effected during the night, when the diminution of evaporating power in the leaves precipitates the sap in a descending course towards the roots.

That in deciduous trees, the annual increase of the trunk and branches taking place in summer, the increase of the roots takes place in winter. The ascending motion is thus suspended by the cold, and the absence of leaves allows the sap to accumulate in the roots, which experience little of the atmospheric variations, and which, in the first warmth of spring, send up their accumulated juices with force through the uppermost parts of the tree.

THE EFFECTS OF MUSIC, ELECTRICITY, MAGNETISM, AND GALVANISM UPON ANIMALS.

BY JAMES FENNELL.

THOUGH music has but little to do with the three sciences with which I have here associated it, yet in connection with them it forms one of the four principal extraneous powers capable of operating in various extraordinary ways upon the senses and actions of animals.

As music consists of sounds emitted from instruments constructed by man, its effects, however enchanting and harmonious they may be, are in reality altogether unnatural; but the various notes that enter into the composition of music are quite natural; being voluntarily produced by animated bodies, and involuntarily produced by inanimate bodies. It is with music, indeed, as it is with all other human productions; for we can merely take to ourselves the merit of having made, in this instance a pleasing combination of natural tones; as in the case of the construction of a clock, or of a steam-engine, we are merely entitled to the praise of having produced useful and mighty effects by an ingenious artificial association of numerous natural principles Thus the notes of music may be all traced to the source from whence they were derived, which source is nature's orchestra; in which her birds and other uninstructed musicians lend their sweet and soothing voices, which intermingling with the deep tones of the wind playing through the thickset grove or hollow cavern, and with the babbling of the running brook, produce a concert possessing charms for the lover of nature, far superior to those which attract the admirers of even the most talented and skilful performer.

The inferior animals being accustomed to the music that resounds through their sylvan haunts, are not affected by it in any peculiar manner, but like our own uncivilised species remain unmoved by it. But instrumental music exercises extraordinary effects upon them. It subdues the rude dispositions of some; arouses the ferocity of others; renders some sufficiently docile and tractable as to be induced fearlessly to approach; while it awakens the alarms of others, and expels them from their abodes. It may be observed, however, that that strain of music which may affect an animal in any particular way, will not be attended with similar results in all others, and in the cases of domesticated animals the effects are various upon different individuals of the

same species*. Having said thus much upon music in general, I shall now proceed to bring forward instances illustrative of my subject.

Of the repulsive effects of music upon animals there is an amusing story in a volume of the London Magazine for 1825, which I here transcribe: "A soldier, who had obtained a passport to go to England from Ireland, being fatigued, sat down in a wood, and commenced eating some victuals which he had brought with him; but suddenly he was surprised by the appearance of two or three wolves, who approached towards him, and to whom he threw, for the sake of ensuring their friendship, bit after bit of his bread and cheese until he had no more to give; and then, as the wolves began to approach nearer, he knew not what to do to appease them otherwise than by playing an air upon his bag pipes; but he had no sooner commenced than to his astonishment they all scampered away. 'The deuce take you all!' cried he; 'had I known that you loved music so well, you should have had it *before* dinner." Sparrman furnishes us with an anecdote of a trumpeter, who by a similar expedient saved himself from falling a prey to a prowling hyæna. "One night, at a feast near the Cape, a trumpeter, who had got himself well filled with liquor, was carried out of doors in order to cool and sober him. The scent of him soon attracted a spotted hyæna, which threw him on his back, and carried him away to Table Mountain, thinking him a corpse, and consequently a fair prize. In the mean time, however, our drunken musician awaked sufficiently sensible to know the danger of his situation, and to sound the alarm with his trumpet, which he carried fastened to his side. The beast, as may be easily imagined, was not less frightened in its turn." From a notice in "Goldsmith's Animated Nature," it appears that crickets are frightened from houses by the sound of music, as he states, that a woman who detested their chirping had her residence accidentally rid of these objects of her dislike, by the playing of a band of music engaged for the amusement of her friends on the occasion of a wedding. Fish, it seems, are usually frightened by music; a circumstance of which the Chinese avail themselves for the purpose of making their finny prey

* For instances of the indifference and the respect of various domesticated animals for the music of the trump-marine, vide "Alphabet of Zoology," page 113. We must not, however, judge of the degrees of musical taste respectively possessed by the animals there mentioned, as they might have been differently affected by other instruments, or by other tunes upon even the same instrument.—J. F.

assemble at one particular spot, where they are captured, consequently, in greater numbers. Captain Basil Hall, in his interesting "Voyages," tells us, that proceeding up a river in China, he and his seamates were somewhat surprised at observing some fishermen in their vessels uttering loud yells and shouts, at the same time striking some of those well-known musical instruments termed "gongs," which were suspended from their masts. The captain at first considered that all this noise was intended to drive away the English Ambassador, who had just arrived; but in this opinion, however, he was soon undeceived by learning that it was merely produced with the view of driving the fishfrom that part of the river to another, where nets were waiting in readiness to receive them *. Æsop would seem to have been aware of the repulsive effect of music upon fishes, as he makes the fisherman in one of his fables fail in his sport in consequence of his playing on the flute.

We will now consider the *attractive* power of music over the brute creation. This power seems to be, from a variety of recorded instances, remarkably apparent in the case of the stag, of which creature it is stated, that upon the sound of music it becomes divested of its natural timidity, and gradually approaches to the place from whence the sounds proceed. "If a person happen to whistle, or call at a distance," says the authoress of the Natural Historian, "the stag stops short, and gazes upon the stranger with a kind of silent admiration; and if he perceives neither fire-arms nor dogs preparing against him, he goes slowly forward, with apparent unconcern. * * * * He seems delighted with the sound of the shepherd's pipe; which, on that account, is sometimes used to lure him to destruction." A dolphin, according to ancient history, was so charmed with the lute of Arion, as to swim towards him and save him from the watery element into which he was necessitated to throw himself, to escape from his mutinous crew, who permitted him, at his request, to chant some sweet strains to his lute previous to his diving into the sea, from which he was so happily rescued by the intervention of this philharmonic fish, who safely conveyed the great musician upon its back to Cape Tænarus in Sparta, where it was taken leave of by its rider, who went thence to the city of Corinth. Mr. Wadd, in an extremely interesting article on "Medical Music," published in the Quarterly Journal of Science, in April 1829, when alluding to the above historical account, justly observes, that "it would

* Hall's Voyages, vol. 1. p. 24.

have been well for the mutineers if their taste for music had been as great as the dolphin's, for the history not only affords a grand instance of the power of music, but of retributive justice, as the sailors accidentally going to Corinth paid the penalty of their evil intentions with their lives." Persons who have been aware of the possibility of attracting animals by music have, according to different writers, resorted to it with great success, when desirous of removing obnoxious animals from their abodes. In Hone's Every Day Book, p. 1372, is given a remarkable (and the reader, perhaps, will say an incredible) account of this kind, with respect to the rat, from Verstegan's Restitution of Decayed Intelligence. This account (which may be found versified in some works) is thus stated: "Hulberstadt, in Germany, was extremely infested with rats, which a certain musician called, from his habits, the 'Pyed Piper' agreed for a great sum of money to destroy; whereupon he tuned his pipes, and the rats immediately followed him to the next river, where they were all drowned. But when the piper demanded his pay, he was refused with some scorn and contempt; upon which he began another tune, and was followed by all the children of the town to a neighbouring hill, called Hamelin, which opened and swallowed them up, and then closed again. One boy, being lame, came after the rest; but seeing what had happened, returned and related this strange circumstance. The story was believed, for the parents never after heard of their lost children. This incident is said to have happened on the 22nd of July, in the year 1376, and that since that time the people of Hulberstadt permit not any drum, pipe, or other instrument, to be sounded in that street which leads to the gate through which the children passed. They also establish a decree, that in all writings of contract or bargain, after the date of our Saviour's nativity, the date also of the year of the children's going forth shall be added in perpetual remembrance of this surprising event." By similar means to those pursued by the revengeful piper towards the rats, the natives of certain countries aresaid to rid themselves of snakes, which by reason of their venom they would not venture to eject from their houses by application to force. "The eastern Indians will rid their houses of the most venomous snakes, by charming them with the sounds of a flute, which calls them out of their holes. Instances of the same kind, however incredible they may appear, are given not only by ancient writers, such as Pliny and Seneca, but by modern authors of undoubted credit, such as Sir William Jones, Bruce, Shaw, Greaves, Forbes, and Chateau-

briand.*" These instances, exhibiting the attractive influence of music over certain creatures, are very curious; but how much more curious is it to find some animals so sensitive to its charms as voluntarily to resort to places where they have learnt by experience that they can gratify their taste by it. In a note prefixed to Innes's edition of Goldsmith's Natural History, we are told, that "an ass at Chartres used to go to the chateau of Quarville, to hear the music that was performed there. The owner of the chateau was a lady, who had an excellent voice; and whenever she began to sing, the ass never failed to draw nearer to the window, and listened very attentively. Once when a piece was performed, which no doubt pleased him better than any he had ever heard before, he left his ordinary post, walked without ceremony into the music-room; and, in order to add to the concert what he thought was alone wanting to render it perfect, began to bray with all his might." I remember having read an account, some time since, of a dog that loved military music, so much as to be in the daily habit of going to some barracks, or court-yard, where a performance of this kind took place.—Though

> "Music's force can tame the furious beast;
> Can make the wolf or foaming boar restrain
> His rage; the lion drop his crested name,
> Attentive to the song;"

yet one would hardly suppose that it would have sufficient influence over a spider as to appease its fears and render it perfectly tame, a matter which one would suppose extremely difficult to effect upon so small a being. But M. Pelissan, when an imprisoned inmate of the Bastile, is said to have gained the friendship of a spider, to whose habits he paid much attention, by means of music. The observations which M. Pelissan made upon the habits and actions of his dumb, but amusing companion, must have tended, in great measure, to divert his mind from the gloomy contemplations which a prison's walls are too well calculated to engender.

I now come to speak of the effects of electricity upon animals:—If we consider electricity with reference to its universal presence, its extraordinary powers, its useful properties, and its awful consequences, we find it embracing some of the most curious and splendid phenomena among the many that engage the attention of the natural philosopher. In this paper I speak of the effects of electricity, magnetism, and gal-

* Mag. Nat. History, vol. i. p. 373.

vanism separately; though modern discoveries, particularly those of Faraday, Ritchie, Pixii, and others, amount almost to a proof that the subjects of these three sciences are merely modifications of the same principle. I would therefore ask, by the way, would it not be better to consider these as constituting three branches of one science, in like manner as we, in natural history, regard ornithology, conchology, and entomology as three branches or sub-sciences of the extensive science of zoology. To say more at present upon this point would be somewhat foreign to the professed object of this paper, and would defeat the aim I have in view of supplying a few pages of interesting and untechnical matter, chiefly intended for the amusement of those who are not over partial to the perusal of the dry details of science.

To describe the effects of electricity, when administered by the electrician to the bodies of animals, would here occupy more space than I can reasonably expect could be conveniently granted for the purpose; therefore I shall confine myself to speaking of the powers of lightning, which is merely a strong electric shock, the thunder by which it is accompanied being the noise of its explosion. The dreadful effects of lightning, in depriving mankind and other creatures of their limbs and senses, and of even life itself, are too well known, from the unfortunate frequency of their occurrence*. The illness and debility which seize some persons previous, and sometimes subsequent, to the discharge of the electric cloud, must have been noticed by almost every one. Pains are felt, particularly in the head and stomach, by some persons (myself included) upon the approach, or after the cessation of lightning; which pains, perhaps, are ascribable to its acidifying property, which appears to convert the food contained within the stomach into acid, as freely and as quickly as it does the beer in a beer barrel. Previous to the appearance of lightning, cattle and most animals, all of whom are, probably, more sensitive than ourselves to the atmospherical changes by which it is no doubt preceded, become restless, and resort to places of protection. Ants, bees, and butterflies, I have, from repeated observations made in the field, been induced to think, diligently avoid exposure to lightning, at least when it is unaccompanied by rain: but how they behave when it is attended with rain I have not as yet remarked. Before the commencement of lightning, and during its pre-

* The best means of guarding against the destructive consequences which so often result from exposure to lightning, will be described in a future communication.—J. F.

valence, ants are seen in great commotion; bees hide themselves in flowers; and butterflies become sluggishly inactive and rest upon the leaves of plants, which leaves, I have reason to believe, are not promiscuously selected. The devastation which lightning commits among the insect tribe, and which is so heartily welcomed by the selfish husbandman, who would deny all such animals as are not convertible into pounds, shillings, and pence, any participation in the fruits of the earth, is a circumstance familiar to all. From the same cause great numbers of fish are said to be destroyed.

Magnetism exhibits its inexplicable effects principally upon metallic bodies; and with the exception of the power attributed to it of curing corns and rheumatism, of stopping vomitings, and of sending persons into so sound a slumber that all endeavours to awake them by hallooing in their ears, or even pinching their flesh, are of no avail, I am only acquainted with one instance (which appears to be well authenticated) of its exercising any effect upon the living body. The instance to which I allude is that of the ill-fated youth Caspar Hauser, who was secretly confined within a dungeon, wherein he lived from his infancy, devoid of speech, a stranger to the light of the heavens and of the beauty and luxuriance of the earth, until at the age of seventeen he was conveyed by the same unknown being, who had hitherto supplied him with bread and water during the time of his unmerited incarceration, to Nuremberg, where he first beheld the face of man, upon being discovered after his abandonment by the wretch who brought him hither while under the influence of sleep. This individual, whose life has recently been taken by an unknown hand at Anspach, where he had long resided under the fostering protection of benevolent individuals, was, it is stated, wonderfully affected by the application of the magnet, as was accidentally discovered by the circumstance of his complaining that a magnetic toy, with which he was presented, occasioned in him disagreeable sensations. Some experiments are said to have been instituted upon him by Professor Daumer, with a view of eliciting the cause and nature of this singular susceptibility to magnetic influence. "When the north pole was presented to him, he complained of pain in his stomach, and that a current of air appeared to flow from him towards the magnet; the south pole had less effect on him. These experiments were varied as much as possible, but he was never deceived*."

Galvanism produces some very remarkable and powerful effects upon

* London Medical and Physical Journal, vol. 70, page 179.

man and other creatures. The saline taste which is conveyed to the tongue, by the mere insertion of that organ between two metallic plates connected to each other in a certain manner, and the sudden and violent convulsions which it produces upon animals when alive or dead, are facts too generally disseminated to require recapitulation at any great length. An extract from a treatise upon galvanism, published in the Library of Useful Knowledge, perhaps will suffice to convey an idea of its effects upon some of the smaller and more sensitive animals. "If a crown piece be laid upon a plate of zinc of larger size, and a living leech be placed upon the silver coin, it will suffer no inconvenience so long as it remains in contact with the silver only; but the moment it has stretched out its head so as to touch the zinc, it suddenly recoils, as if it had experienced a painful shock. An earthworm will also exhibit the same kind of sensitiveness; and the same effect is still more strikingly exemplified by the *nais*, which is an aquatic worm. Humboldt found that the *cernæa*, or water-serpent, and even *vænia*, *ascaris*, and other species of intestinal worms, had their movements accelerated by the influence of galvanism, which altogether speedily destroyed their life. Powerful shocks from a voltaic battery are no less immediately fatal to animals than discharges from an ordinary electric battery. Small animals are easily killed by discharges which would only produce a temporary stunning effect on larger animals*."

At a future period I may have occasion to revert to the subjects here introduced, in an article on the distribution of electricity among animated beings.

Paddington.

ON THE SINGING OF THE SWAN.

BY SIR T. BROWNE, M. D., NORWICH†.

From great antiquity, and before the melody of syrens, the musical note of swans hath been commended, and that they sing most sweetly before their death. For thus we read in Plato, that from the opinion of Metempsychosis, or transmigration of the souls of men into the bodies of beasts most suitable unto their humane condition, after his death Orpheus the musician became a swan. Thus was it the bird of Apollo

* Treatise on Galvanism, page 79.

† From Pseudodoxia Epidemica.

the god of music by the Greeks; and an hieroglyphic of music among the Egyptians, from whom the Greeks derived the conception—hath been the affirmation of many Latines, and hath not wanted asserters almost from every nation.

All which notwithstanding, we find this relation doubtfully received by Ælian, as an hearsay account by Bellonius, as a false one by Pliny, expressly refuted by Myndius, in Athenæus, and severely rejected by Scaliger; whose words unto Cardan are these, "You are a goose to throw a light upon the true sweet song of the swan, which of the story tellers I appoint, with their parent Greece, a tribunal to Lucian about which you will say something new." Authors also that countenance it speak not satisfactorily of it. Some affirming they sing not till they die; some that they sing, yet die not. Some speak generally, as though this note were in all; some but particularly, as though it were only in some; some in places remote, and where we can have no trial of it, others in places where every experience can refute it; as Aldrovandus, upon relation, delivered concerning the music of the swans on the river Thames near London.

Now that which countenanceth, and probably confirmeth this opinion, is the strange and unusual conformation of the windpipe, or vocal organ in this animal; a figuration to be found in elks, and not in common swans, observed first by Aldrovandus, and conceived by some contrived for this intention. For in its length it far exceedeth the gullet; and hath in the chest a famous revolution; that is, when it ariseth from the lungs, it ascendeth out directly unto the throat, but descending first into a capsulary reception of the breast bone, by a serpentine and trumpet recurvation it ascendeth again into the neck; and so by length thereof, a great quantity of ayr is received, and by the figure thereof a musical modulation effected. But to speak indifferently, this formation of the weazen is not peculiar unto the swan, but common also unto the platea or shovelard, a bird of no musical throat; and, as Aldrovandus confesseth, may thus be contrived in the swan to contain a larger stock of ayr, whereby being to feed on weeds at the bottom, they might the longer space detain their heads under water. But were this formation peculiar, or had they unto this effect an advantage from this part, yet have a known and open disadvantage from another, that is, a flat bill. For no latirostrous animals, (whereof nevertheless there are no slender numbers,) were ever commended for their note, or accounted among those animals which have been instructed tospeak.

When, therefore, we consider the dissension of authors, the falsity of

relations, the indisposition of the organs, and the unmusical note of all we ever beheld or heard of; if generally taken, and comprehending all swans, or of all places, we cannot assent thereto. Surely he that is bit with a tarantula shall never be cured by this music; and with the same hopes we expect to hear the harmony of the spheres.

ON INSTINCT IN BIRDS.

BY C. W. S.

It is my present intention to make known to you a few facts, which have come under my own observation, illustrative of the partial loss, or modification, of instinct in animals, which frequently takes place in them when domesticated. I think that caged birds often lose the habit of swallowing gravel for the purpose of grinding their food in the gizzard. I generally open my own birds which die, and have always found a deficiency of gravel, from which circumstance I am induced to believe that the diseases of caged birds are very often owing to their losing the instinct of swallowing gravel.* I observed one of my redpolls the other day in a fit, tumbling about in violent convulsions; he remained so for about two hours, during which time I, for an experiment, made him swallow some drops of sherry, without its seeming to have any very good effect; I then, with a great deal of trouble, forced three little pebble stones down his throat, and he has had no recurrence of the fit, though he does not look quite well. I think that the above-mentioned case shows evidently that the bird had partially lost its instinct. I once put two hen canaries, with one cock, into a breeding cage; one of the hens immediately paired, but the other was of too quarrelsome a disposition, and was continually fighting with its two fellow prisoners. She, however, built a nest by herself; and as her eggs were addled, I put some chaffinches' and green linnets' eggs under her, which she afterwards hatched. But I will proceed to relate the more remarkable part of the affair. As the single hen hatched more young ones than the other, I took some from under her, and put them under the other hen; this she immediately discovered, and used to go over and feed her young one on the other's nest; and, what was most extraordinary, used to feed the other old hen as well, whenever she found her sitting

* I have entered minutely into the subject of birds swallowing gravel in "Faculties of Birds," Chapter v.—Ed.

on the young ones, though if she met her any where off the nest, she used invariably to fight. The above fact seems to show a kind of blindness in instinct. I have put green linnets and chaffinches, nearly fledged, into canaries' nests, when their own young ones have been just hatched, and they seem to have generally observed no difference, but fed them and brought them up as their own. I, however, once put some young whitethroats into a canary's nest, but she refused to feed them, though they opened their mouths most importunately; but these were very nearly full-fledged birds, and of course looked very dissimilar to young canaries. I once paired a couple of green linnets, and the hen laid as many as six eggs: the cock, however, had so far lost his original instinct, that one day, after the eggs had been sat upon for several days, he went and turned the nest quite over and broke the eggs. I also had a bullfinch who had two sets of eggs, but the cock broke them in the same manner. I will conclude my remarks by an instance of very early formed instinct: I once broke a chaffinch's egg, in which I found a young one, with its stomach as yet in a fluid state; it, however, opened its mouth and swallowed some food which I gave it even at this early period; I tried to bring it to maturity under a canary, but it was so fluid that it dried to the shell and died.

Stepney.

CHAPTER OF VARIETIES.

EFFECTS OF INUNDATIONS ON THE HAUNTS OF SMALL BIRDS.—In the month of August, 1829, the estate of Ballindalloch, in Banffshire, was among others a very great sufferer by the dreadful floods which at that period devastated almost the whole of the north of Scotland. The house was surrounded with water for upwards of eighteen hours; and the garden, pleasure grounds, and parks, were all either destroyed or very much injured. But what I think most surprising, in connexion with this, was the almost total desertion of the smaller birds which then took place, and was so remarkable as to attract the notice of the most careless observers.

Before this inundation, the chaffinches and house sparrows in particular, had become so numerous as to be a perfect pest, and nothing in the garden was secure from their depredations. The latter of these birds built in great numbers, not only in holes of the garden wall, and under the eaves of the out-houses, but nestled also on the tops of some lofty

silver firs, the summits of which were quite filled with their "straw-built sheds." After the subsiding of the waters, and for the greater part of the season which succeeded this visitation, very few chaffinches, and not a single sparrow, were seen. The former, however, gradually returned, and are now nearly as numerous as ever; but of the latter, not one individual, as far as I can learn, has since been noticed, though I have been very assiduous in looking for them myself, and in inquiring of all others who were likely to have observed them. What seems to me to make this still more surprising, is the fact that there is a great extent of wooded bank not a hundred yards from their usual haunts, which was quite beyond the reach of the water, and on an elevated part of which the silver firs grow, in which, as I have already observed, many of their nests were built.

I cannot think that the destruction of the garden is the cause of it, for this reason, that a new one has been formed, at a little distance, no doubt, from its predecessor, but still on a spot, the neighbourhood of which they used formerly to frequent, and in it I have seen numbers of chaffinches, hedge-chanters, redbreasts, and other small birds, but never could distinguish any sparrows among them. All the other grounds near the house have been restored to their former condition, so that no change *on* them can account for it.

Should you think this worthy of a corner in your Magazine, I will feel much indebted to any of your numerous readers, who can suggest a reason for this curious desertion of so common and familiar a bird*.

T. M. G.

Edinburgh.

Black Rat.—It is, I believe, very generally supposed that the black rat of this country has become very rare, and that it is now almost every where superseded by the larger brown species; so that the circumstance of it still being common in one part of this island may not be, perhaps, altogether uninteresting. At Ballindalloch they are at present very numerous, and are the only species of rat known there, principally frequenting the granaries and stables, where they do a great deal of damage. It is, however, not long since they made their appearance; as I recollect, some years ago, that there was not a single rat of any kind to be seen on that property. The black rat is in every respect much less offensive than the brown one; it is also smaller, and has

* An exceedingly curious and interesting fact. Other communications from T. M. G. will be very acceptable.—Ed.

more of the shape and general appearance of a mouse, while its glossy black fur and long tail make it, in my opinion at least, a very handsome animal*.

T. M. G.

Edinburgh.

SPARROWS BUILDING IN WINTER.—I was a good deal surprised to-day, to see a sparrow with a large feather in its bill. It was sitting on the ground when I first observed it, where it remained for some time, while it looked about with as much caution and circumspection as they generally do in spring, when they are afraid of their nest being discovered. After a little it flew away with its treasure, but I could not see where it went. I noticed one some time ago carrying off some straws, but unfortunately neglected to note it down. The frost is at present severe, and has been so for a day or two; so that it cannot be supposed that the sparrow intended to employ the feather in the construction of a nest †.

T. M. G.

Edinburgh.

JANUARY REMARKS.—In the Field Diary of "Solitarius," in your last number, he mentions not having met with any thing in the month of January *peculiar* to it; and he states, under date of April 13th, 1833, that the *Pulex irritans* "appeared," as if it were for the first time that year. Now I captured a very fine one on the 15th of January instant. I know not if you or your correspondent will think this worthy of notice. I consider that in mild winters, like the present, this insect may be found, not only in one particular month, but any day or night during the season.

I beg to add, that a solitary *Musca domestica* remained in my room up to the 16th instant, since which it has disappeared. It seemed in a very healthy and lively state, and there were others with it till very lately. I should be glad to learn from you if these insects survive the winter or not?

A friend brought me a short time ago a kitten with a double head, complete in every respect, except that the two eyes, which came to-

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* Could T. M. G. favour us with a specimen or two of the stuffed skins, sent to Messrs. Orr and Smith, through Messrs. Chambers, Edinburgh?—ED.

† As the sparrow is very fond of warmth, (see Faculties of Birds, chap. i.) might not this be for lining a roosting, not a breeding, nest?—ED.

gether in the centre, appeared to be formed into one, of larger dimensions than the other two. The scull &c. I have preserved in spirits, and the skin has been stuffed by Mr. John Ware, of this town. By the way, John Ware is a taxidermist of some celebrity—he is also a ventriloquist and a musician, and upon the whole a great natural genius, worthy of a recommendation in your valuable work.

The neighbourhood of a large town, like this, is not very favourable for observations in natural history; but I intend to record such things as may come under my notice relating to it, and send them to you, if you think them worthy of your acceptance*. M.

Southampton.

RAT'S NEST.—In removing a stack of paper, some time since, I was surprised to see a full-grown Norway rat (*Rattus decumanus*, Fleming) issue from the centre; this excited my interest, and the probability of her having just left a nest made me remove the remaining bundles with the greatest care. The desideratum was soon discovered; she had excavated one of the reams so completely, that but for the aperture at which she entered, it would have deceived the most scrutinising eye. No young were there; but by the quantity of dung behind the stack she must have lived there *multos per annos*, and had probably reared many a "*progeny*."

RAZOR BILL (*Alca Torda*, Linn.)—A very fine specimen of this singular bird was shot in the parish of Bew Castle, a few miles from Carlisle, a short time ago. It was esteemed rather a curiosity, being seldom met with so far inland. The great winds, which have been so prevalent lately, have probably had some hand in its appearance so far out of its "latitude," as well as in that of the Northern Diver (*Colymbus glacialis*), a specimen of which bird has now for more than ten weeks been sojourning at the farm, a small lake near Brampton, in this county. The capabilities of this bird for diving have hitherto enabled it to escape all the contrivances of neighbouring sportsmen for its destruction. F. J.

Carlisle.

HOSTILITY EVINCED BY THE LAPWING TO CROWS.—Most persons residing in the country must have observed the determined hostility

* The Editor will feel obliged by M.'s future correspondence

shown by the lapwing against the crow, whenever the latter has the audacity to enter a field in which the lapwing has chanced for a time to take up its residence. On such occasions, immediately the intruder is discovered, he is pursued with the greatest animosity, until driven away from his enemy's dominions; and it is rare, indeed, that the crow has the courage to face its opponent, who keeps up the attack on all sides, and without intermission. This takes place during the breeding season, either when the eggs are being hatched, or the young ones are not sufficiently grown to be left to themselves; but at no other time, as I have often observed, and as any person may observe for himself, in the autumn of the year, when numbers of lapwings may be seen feeding and flying quite peaceably with flocks of crows. Whether this aversion on the part of the "peewit" proceeds from mere jealousy, or is the effect of that wonderful power of instinct, which in this instance might lead that bird to evince hostility in order to protect its young from the ravenous maw of the crow, I must leave to some one more experienced in the study of natural history than myself to determine. F. J.

Carlisle.

TRANSPARENCY OF THE SEA.—Having been struck by the descriptions of the transparent clearness of the sea in high latitudes, and also near the line, and far from land, in many situations, I feel surprise that so little advantage has been taken of this by naturalists, to attempt to discover plants and animals living at such a depth, as to be unlikely ever to be discovered by any other means than by sight. Times may occur, in a long voyage, when on these deep seas (the surface may be so still and quiet) that telescopes might enable the eye to penetrate many miles down, and bring to our view many of those creatures still living, which are supposed to have been destroyed, and not to have lived since the creation of man. Over these immense plains, lofty mountains, and dense groves, two or three miles from the surface of the sea, far out of the reach of winds, and storms, and currents, may even now exist those huge snails, the Cornua Ammonis, the Nautilus with its own proper inhabitant, the Megalosaurus, Icthyosaurus, Plesiosaurus, Ornithocephali, Mammoths, &c., &c. All these may, most of them certainly could, live at these immense depths, and in the dense air, as we know our own toads, frogs, and newts can do. No argument against this can be framed on the fact, that their recent remains are never found thrown up on any shores; because the great depth at which they live would render it impossible for any storm ever to disturb them; and if

the animals lived at the bottom, their remains could never rise to the top, through such a prodigious weight of water and of air. There, therefore, they may be at this very day—and in my opinion are: as, from analogy, no part of nature that we are acquainted with is void of inhabitants. If you like to insert this it is at your service. P. W.

HAWK SHOOTING—I read with interest in the 1st number of the "Field Naturalist," an interesting account of an ingenious method of shooting eagles in the Alps. Since that time, I have heard that a similar plan for shooting hawks has been adopted by a clever and intelligent gamekeeper at W——. He has two tame hawks, (a kestrel and a sparrow hawk) which he stakes down in some exposed situation, at the distance of about a yard from each other, and places a dead rabbit or pigeon between them. He then stations himself in concealment behind some neighbouring hedge or tree. If there are any hawks in the neighbourhood, they are almost immediately attracted to the spot, either from motives of curiosity or anger, and afford an easy shot. What is worthy of remark is, that all kinds of hawks seem to be equally attracted by this lure. C. B.

January 23, 1834.

ESTABLISHMENT OF A ROOKERY.—Although T. C. has already replied to the sweeping demands of N. N. for accounts of the best mode of improving nature, and although I cannot inform him on *all* his innumerable points of inquiry, yet I *can* tell him how (please the rooks) to *establish* a rookery. In Northamptonshire there is a village where three rookeries have been established by the following plan; namely, removing the eggs of the first magpie that builds in the desired locality, and substituting those of rooks; of course this presupposes the existence of a magpie's nest, but few large clumps of trees are without that, in Northamptonshire at least. If no magpie will build, I cannot help him.

Your correspondent A. T., *Capel Curig*, has, I think, been misled by Bewick's cut into a belief that the female Red-backed Shrike was a Woodchat. This uncommon visiter of our country is there so ill described, and the cut is so carelessly done, that I was in the same manner deceived until I got your edition of Montagu, where I found it properly described as totally distinct from the hen-flusher.

If A. T. ever visits London, he might see preserved specimens of the *Woodchat* at Mr. Ashmead's, bird preserver, in Duke Street, Grosvenor Square, in good plumage, and well set up. T.

SANDPIPER AND STINT.—Presuming an interrogatory communication to be not entirely repugnant to the plan of your Magazine, I have sent the following, it being to me the only plan of solving the difficulty in which I find myself.

I have often remarked, during my ornithological rambles on the coast, the alternately dark and white appearance presented by the flocks of a species of Sandpiper, as they skim the surface of the water.

Till your edition of Montagu came into my hands, I had always regarded it as the Stint (*Fringa Cinclus*) of Bewick. Now in Montagu the stint is said to be a name for the Dunlin, which it seems is not abundant, (whereas this species is extremely so,) and no notice is taken of the characteristic I have mentioned.

Now the question is, am I right in calling it the *Fringa variabilis?* it seems strange that Montagu should have omitted so striking a peculiarity. PLINY.

Lancaster.

ROOKERIES.—At a village called Hatherby, about four miles from Gloucester, there is a rookery, the nests of which are built in *poplar trees;* is it not an unusual thing?

In the last number, December, N. N. wants to know how he may establish a rookery; I have been told it may be accomplished by placing some old nests in the trees where you wish to establish one.

ALPHA.

Gloucester.

SAGACITY IN A HORSE.—I am unwilling to trespass on the public stock of room in the Field Nat.'s pages, but have just seen an instance of sagacity worthy of notice,—that of a horse in one of those large coal-waggons going down one of the steep avenues to the Thames, turning the fore wheel against the curb-stone, and keeping it there as a *drag* during the whole descent. T.

SINGULAR HABIT IN A BACHELOR'S CAT.—If the following remarkable fact is likely to amuse any of your readers, you will oblige a great admirer of your "Field Naturalist." I am a bachelor, and really a happy one, though I anticipate many an incredulous smile on the lips of some of your fairer readers for my choice of the epithet; but I am a bachelor, and *consequently* never pass an evening, when alone, without my tea, with which I generally have an egg boiled, or a fine Yarmouth

herring broiled. I have a fine old motherly-looking cat, who is never allowed to come near my "sanctum sanctorum;" but whenever *I ring the bell* for the removal of my tea-table, she starts up before the servant, and waits on the staircase for her morsel. This *only* takes place when my *egg*, or herring, is ordered; and she eats the egg-shell with quite as much relish as the herring-bones: if I have neither egg nor herring, the sound of the bell has no charms for her, and she does not even stir from her fire-side.

I can readily imagine her finding out the herring, but cannot see how she can detect the egg, which she runs up stairs for with such glee.—From a great admirer of Nature, and of *your* valuable labours.

S.

Shrewsbury.

EFFECTS OF MOUNTAIN HEIGHTS ON PLANTS.—M. Gay, in his recent interesting tour among the Cordilleras, discoverd many beautiful and rare species of *Baccharis, Loasea, Alstræmeria,* and, "above all," he says, "those charming *Mutisia* which exhibit this singular phenomenon." The tendrils with which these plants are usually furnished, becoming useless in these cold regions, unprovided with shrubs or bushes, change into real leaves, organs of such great utility to alpine plants. I have also remarked that the plants which are herbaceous in the plains, become here entirely ligneous; and that several trees, especially the *Escallonia,* instead of assuming that forked appearance which characterises it, becomes stunted, creeping along the rocks, and thus offering less surface to the cold, with which the wind is charged in passing over these numerous and immense glaciers. But another observation which I have also made among these cold regions, is still more interesting; it is the form of imbricated leaves, which the greater portion of the vegetables assume—those genera even whose habitual form seems to be entirely contrary to this disposition. Thus, the leaves of the *Triptilions,* which are so lax and small in the lower regions, become here extremely hard and tough, closely imbricating the stalk, and even the flowers of these beautiful plants; the *Mutisia,* which is nearly devoid of leaves, when at the side of the mountains, produces at their summit a considerable number. The Violets here have not that elegant form which we observe in those lower down, but are found under a form altogether different; they represent a rosette, which may be compared to that of a *Sedum,* with this difference, that the leaves, instead of being almost vertical, are in these alpine violets entirely hori-

zontal. These leaves, which are extremely hard and tough, are round, scabrous, strongly imbricated, and exhibit at the footstalks flowers, which are sessile, and of a violet colour, somewhat approaching to red. Although very familiar with the genera *Triptilion, Escallonia, Mutisia, Viola,* the particular aspect of these alpine species caused me to mistake them entirely, and I did not discover to what genus they belonged, until I studied them after my return."

MIGRATORY BIRDS IN CORNWALL.—I have taken the liberty of sending to you a list of birds that frequent this neighbourhood in the summer; together with a few others which visit us in the winter. Should you deem them worthy of insertion in the "Field Naturalist," you will oblige your constant reader,

Those marked with an asterisk are rare.

	Arrival.	Departure.
Chiff Chaff (*Trochilus rufa*) - - -	2nd April	lat. end Sept.
Swallows‡ (*Hirundo, rustica and urbica*)	14th do.	begin. Oct.
Curlew, (*Scolopax Arquata*) - - -	22nd do.	middle Aug.
Reed Bird (*Ripœcola arundinacea*) - -	26th do.	lat. end Sept.
Cuckoo (*Cuculus canorus*) - - -	28th do.	begin. Aug.
Whitethroat (*Sylvia cinerea*) - -	1st May	begin. Sept.
Turtle Dove (*Columba Turtur*) - -	5th do.	middle do.
Bearded Tit* (*Parus Biarmicus*) - -	do. do.	do. do.
Black-cap Warbler* (*Sylvia Atricapilla*) -	do. do.	do. do.
Spotted Fly Catcher* (*Muscicapa Grisola*)	middle do.	middle do.
Red-backed Shrike* (*Lanius Collurio*) -	do. do.	begin. do.

The following birds visit us in the fall of the year and depart in spring:—wild goose, wild duck, wigeon, teal, heron, woodcock, snipe, lapwing, dottrel, terns, redwing, bluebird, and kingfisher; after minute observation I may venture to say none of these birds breed here.

The long-tail tits, together with a host of golden-crested wrens and other tits, I have observed this winter (as is usual with them) congregated together, flying from tree to tree in perfect friendship.

P.S. Should these my first gleanings be acceptable, I shall always feel happy in doing my best endeavours to contribute to your interesting Magazine. E. P.

Penzance, Cornwall.

‡ The Swift and Bank Martin are very rare in this neighbourhood.

FLOATING ISLANDS.—In the province of Colchagna, M. Gay found, near Tagnatagua, an extensive lake, "in which," he says, "I saw, for the first time, that singular phenomenon, a great number of floating islands directed entirely by the winds. Having studied a certain number of these islands with great care, I observed that they were composed entirely of the remains of several vegetables, and especially of the stalks of *Typha, Arundo, Convolvulus,* &c., interlaced in a thousand different ways, and forming a species of net-work, on which had been driven many other plants; these latter, decaying, deposited a mould, which increased from day to day, and became at length capable of receiving shrubs and even trees of a moderate size. Their form is generally circular, and their thickness four or six feet; the greatest part of which is sunk in the water.

As this lake is nearly desert, and surrounded by very high mountains, birds of every genus and species repair to it in flocks, and add to the truly picturesque aspect of its environs that gay and animated air which is so pleasing to the landscape painter; it was, indeed, both curious and agreeable, to see at one time this prodigious quantity of birds navigating peaceably among these floating islands; some of them, such as the black-necked swan, the numerous varieties of ducks, trails, cocks, &c., seemed to prefer the middle, while the ibis, spoonbill, flamingo, *hyalus,* and an infinity of other wading birds, with a beak more or less slender, wandered by the banks, quietly seeking objects for food, at the bottom of the water. I visited for several days the greater part of these isles, which enriched me with several very interesting plants, such as *Convolvulus, Ranunculus, Istricularia,* and other European genera, and, above all, with a series of beautiful nests and eggs, objects which are so neglected by travellers, and yet possessing such real interest in the natural history of birds."

ON THE ANIMALCULÆ FOUND IN WATER, &c.—There is, perhaps, no more surprising fact in the study of nature, than the existence of such minute beings as these. That each of these creatures which are invisible to the naked eye, unaided by the microscope, possesses a perfect set of organs, as well calculated to perform every function as those of superior animals,—those who have attentively studied can testify. But the most extraordinary fact, and one which (I confess) fairly puzzles me, is the theory of their production. I have made some trifling experiments on this subject but can form no satisfactory conclusion. I made an infusion of hay in spring water, and after letting it remain

two days, I tried it with my microscope, but I could perceive no living creature whatever; I tried it again after four days, but with as little success. I then let the infusion stand till it became putrid, when I found that it absolutely teemed with life. I perceived among others the Verticella, or wheel animalcule, that shaped like an eel, and some round ones, edged with spiculæ, which last revolved similar to the wheel animalcule. I should observe, that some of the latter possessed a kind of tail. I never observed any living creature in good spring water, though many impurities. There can be no doubt, I think, that they owe their being to decomposition, which is certainly one of the most wonderful and important phenomena of nature. I should feel grateful if some of your correspondents would be so kind as to give me a few hints upon this subject; viz., by investigating in some future number, the changes which take place among the particles of vegetable matter when submitted to the putrefactive process, so as to produce these singular creatures. TYRO.

June 1st, 1833.

FANNING OF THE WINGS OF CERTAIN INSECTS.—May not the constant fanning of the wings of certain insects, particularly those of the genus *Vanessa*, and the constant vibration of the wings of *Seioptera vibrans*, &c., be intended to create a current of wind to repel the attacks of acaridæ and other little parasites, most of whom have an obvious antipathy to it? The explanation which some have given, of this fanning being produced by the insects to *cool* themselves, I think is not very likely to be correct, for other insects equally exposed to the summer's heat do not practise this habit. The notion which some have entertained, and stated, of this being performed to assist the circulation of the fluids of the insects, I am just as little inclined to adopt.

Paddington. JAMES FENNELL.

ANIMALS SWALLOWING HARD SUBSTANCES.—Ostriches, as is well known, will purposely swallow, and without injury, hard substances, such as stones, &c., which are digested whole, as they do not possess the incredible powers of digestion attributed to one Francis Bathalia, who is said to have been capable of swallowing flints, and then, at the expiration of a week, passing them in the shape of sand. The stomach of the ostrich is so simple and so strong, as readily to admit of the safe passage of pointed nails, keen edged stones, and even sharp knives, as

frequent experiments have satisfactorily proved. It seems, indeed, to be absolutely necessary that the stomachs of some birds shall always contain pieces of stones and other hard bodies for the purpose of assisting and facilitating the process of digestion. Messrs. Kirby and Spence, in their Introduction to Entomology, tell us, that one of the camellicorn timber beetles occasionally gnaws a passage through sheets of lead, the particles of which are taken into the stomach. "The larva of a *Cerambyx*," say these famed entomologists, "which Dr. Leach has discovered to be *Cerambyx bajulus*, sometimes does material injury to the woodwork of the roofs of houses in London, piercing in every direction the fir-rafters, and when arrived at the perfect state, making its way out even through sheets of lead one-sixth of an inch thick, when they happen to have been nailed upon the rafter in which it has assumed its final metamorphosis." They afterwards mention their being "indebted to the kindness of Sir Joseph Banks for a specimen of such a sheet of lead which, though only eight inches long and four broad, is thus pierced with twelve oval holes, of some of which the longest diameter is a quarter of an inch! Mr. Charles Miller first discovered lead in the stomach of this insect." Hard substances are sometimes swallowed by animals, without any better motive than that of mischief. D'Azara mentions the circumstance of an American tapir, (*Tapirus Americanus*,) which he kept domesticated, swallowing his silver snuff-box. The ingulfment of D'Azara's snuff-box (are *naturalists* really given to taking snuff?) was not a matter of so serious a moment as that detailed in the following account of an expensive meal made by an elephant, as reported in the Morning Chronicle of September 19, 1833. "On Friday afternoon, at the Zoological Gardens, Regent's Park, a lady was holding a biscuit to the elephant from the top of her reticule, when the animal, mistaking the extent of the lady's generosity, seized the reticule with his trunk, and conveyed it with its contents, consisting of a ten-pound note, some loose money, and a bunch of keys, into his stomach, to the dismay of the lady and amusement of the bystanders." The animal in this case, no doubt, swallowed the keys to open his *trunk*, but what he needed the money for, unless to present his keeper with a pecuniary reward, is difficult to discover. What a pity that the thought did not occur to the lady, of sending for an officer to overhaul the trunk, and insist upon the seizure of the smuggled goods.

SOLITARIUS.

Paddington.